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SHARP 14BM2 SERVICE MANUAL

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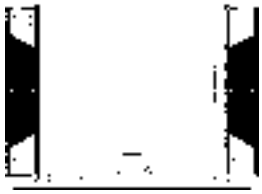
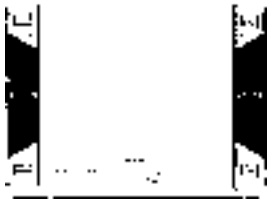
SERVICE MANUAL

S00K414BM2S//

14BM2, 14BM2S/G



20BM2, 20BM2S/G



21BM2, 21BM2S/G

COLOUR TELEVISION

Chassis No. UA-1

MODELS 14BM2, 14BM2S/G 20BM2, 20BM2S/G 21BM2, 21BM2S/G

In the interests of user-safety (Required by safety regulations in some countries) the set should be restored to its original condition and only parts identical to those specified should be used.

FEATURE

- Multi 18 Systems
- Full Auto Channel Preset and Auto Channel Skip
- 100-CH Program Memory
- High Contrast Picture
- Black Stretch Circuit
- CATV (Hyper Band) Ready
  〈Used Frequency Synthesizer Tuner〉
- Hotel Mode
- On Timer/Sleep Timer/Reminder Timer
- Colour Comb Filter Function (NTSC only)
- Blue Back Noise Mute
- Front AV-In & Rear AV-In/Out Terminals
- AVL Function
- English/Chinese/Malay/France/Russia/Arabic OSD

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WARNING

The chassis in this receiver is partially hot. Use an isolation transformer between the line cord plug and power receptacle, when servicing this chassis. To prevent electric shock, do not remove cover. No user – serviceable parts inside. Refer servicing to qualified service personnel.

SPECIFICATIONS

Convergence ..... Self Convergence System
Focus ..... Electrostatic Focus High Bi-Potential

Sweep Deflection ..... Magnetic
Intermediate Frequencies
  Picture IF Carrier ..... 38.9 MHz
  Sound IF Carrier Frequency
    5.5 MHz ..... 33.4 MHz
    6.0 MHz ..... 32.9 MHz
    6.5 MHz ..... 32.4 MHz
    Colour Sub-Carrier Frequency ..... 34.47 MHz

Power Input ..... 110 - 240V, AC50/60 Hz

Power Consumption
  21BM2 ..... 88 W
  20BM2 ..... 87 W
  14BM2 ..... 68 W

Audio Power Output Rating ..... 5.0W (RMS)

Speaker
  Size
    21BM2/20BM2 ..... 6 × 12 cm Elliptic (2 pcs.)
    14BM2 ..... 5 × 9 cm Elliptic (2 pcs.)
  Voice Coil Impedance ..... 6 ohms at 400 Hz

Aerial Input Impedance
  VHF/UHF ..... 75 ohms Unbalanced
  Receiving System ..... CCIR/PAL B/G, D/K, I/SECAM
    NTSC 3.58/4.43 MHz (thru AV)

Tuner Ranges
  • VHF-Channels ..... E1 (48.25 MHz) thru E12 (224.25 MHz)
    C1 (49.75 MHz) thru C12 (216.25 MHz)
    S1 (105.25 MHz) thru S41 (463.25 MHz)

  • UHF-Channels ..... E21 (471.25 MHz) thru E69 (855.25 MHz)
    C13 (471.25MHz) thru C57 (863.25 MHz)

Dimensions
  21BM2 ..... Width: 642.0 mm
    Height: 475.0 mm
    Depth: 477.0 mm
    Weight (approx.): 21.0 kg
  20BM2 ..... Width: 642.0 mm
    Height: 475.0 mm
    Depth: 480.0 mm
    Weight (approx.): 19.0 kg
  14BM2 ..... Width: 496.0 mm
    Height: 355.0 mm
    Depth: 365.0 mm
    Weight (approx.):9.2 kg
Cabinet Material ..... All Plastics

Specifications are subject to change without prior notice.

IMPORTANT SERVICE NOTES

Maintenance and repair of this receiver should be done by qualified service personnel only.

SERVICING OF HIGH VOLTAGE SYSTEM AND PICTURE TUBE

When servicing the high voltage system, remove static charge from it by connecting a 10k ohm Resistor in series with an insulated wire (such as a test probe) between picture tube dag and 2nd anode lead. (AC line cord should be disconnected from AC outlet.)

1. **Picture tube in this receiver employs integral implosion protection.**
2. **Replace with tube of the same type number for continued safety.**
3. **Do not lift picture tube by the neck.**
4. **Handle the picture tube only when wearing shatterproof goggles and after discharging the high voltage completely**

X-RAY

This receiver is designed so that any X-Ray radiation is kept to an absolute minimum. Since certain malfunctions or servicing may produce potentially hazardous radiation with prolonged exposure at close range, the following precautions should be observed:

1. **14BM2 : When repairing the circuit, be sure not to increase the high voltage to more than 25.5 kV (at beam 0.1 μA) for the set.**
   20BM2 : When repairing the circuit, be sure not to increase the high voltage to more than 28.0 kV (at beam 0.1 μA) for the set.
   21BM2 : When repairing the circuit, be sure not to increase the high voltage to more than 28.0 kV (at beam 0.1 μA) for the set.
2. **14BM2 : To keep the set in a normal operation, be sure to make it function on 22.8 kV ± 1.5 kV (at beam 800 μA) in the case of the set. The set has been factory - Adjusted to the above-mentioned high voltage.**
   20BM2 : To keep the set in a normal operation, be sure to make it function on 24.5 kV ± 1.5 kV (at beam 1,100 μA) in the case of the set. The set has been factory - Adjusted to the above-mentioned high voltage.
   21BM2 : To keep the set in a normal operation, be sure to make it function on 24.8 kV ± 1.5 kV (at beam 1,100 μA) in the case of the set. The set has been factory – Adjusted to the above-mentioned high voltage.
   ∴ If there is a possibility that the high voltage fluctuates as a result of the repairs, never forget to check for such high voltage after the work.
3. **Do not substitute a picture tube with unauthorized types and/or brands which may cause excess X-ray radiation.**

BEFORE RETURNING THE RECEIVER

Before returning the receiver to the user, perform the following safety checks.

1. **Inspect all lead dress to make certain that leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the receiver.**
2. **Inspect all protective devices such as non-metallic control knobs, insulating fishpapers, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacity networks, mechanical insulators etc.**

ADJUSTMENT PRECAUTIONS

This model's setting are adjusted in two different ways: though the I²C bus control and in the conventional analog manner. The adjustments via the I²C bus control include preset-only items and variable data.

1. Setting the service mode by the microprocessor.

① Short JA122 & JA124 for 1 second and release to switch to the service mode position, and the microprocessor is in input mode. (Adjustment through the I²C bus control). (Use JWS Key to set as well).
② Press the CH DOWN / UP key on the remote controller to get ready to select the mode one by one.
③ Press the CH DOWN / UP key on the remote controller to select the modes reversibly one by one.
④ Using the VOLUME UP/ DOWN key on the remote controller, the data can be modified.
⑤ Short JA122 & JA124 for 1 second and release to switch to the normal mode (OFF) position, and the microprocessor is in out of the service mode.

2. Factory Presetting.

① Short JA122 & JA124 for 1 second and release to switch to the service mode position and turn on the main power switch. Initial values are automatically preset, only when a new EEPROM is used (Judge with the first 4 bytes).
② The initial data are preset as listed in pages 4, 5 & 6.
③ Make sure the data need modify or not (Initial data).

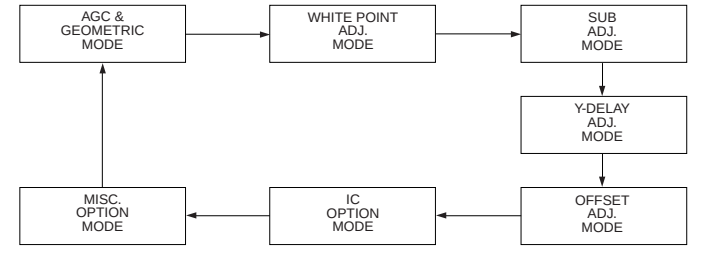
Note: Once the chassis has been assembly together and ready to be POWER ON for the FIRST TIME, make sure to short JA122 & JA124 switch to the service mode position first and then turn on the main power switch. (See 2- ① above).

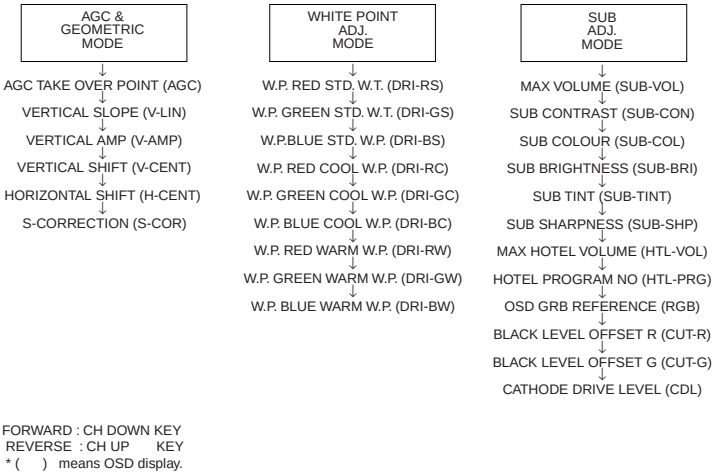
Precaution: If haven't done this initiation, it may possibly generate excessive Beam current.

3. For reference please check with memory map (UA1 Series type RH-IX3368CE Attachment)

■ SERVICE MODE

(1) In the Service Mode, Key is used to select the mode in the following order.





FORWARD : CH DOWN KEY
REVERSE : CH UP KEY
* ( ) means OSD display.

Y-DELAY ADJ. MODE
Y-D TIME FOR PAL (TV) (DL-PT)
Y-D TIME FOR SECAM (TV) (DL-ST)
Y-D TIME FOR N358 (TV) (DL-3T)
Y-D TIME FOR N443 (TV) (DL-4T)
Y-D TIME FOR B/W (TV) (DL-TV)
Y-D TIME FOR PAL (AV) (DL-PA)
Y-D TIME FOR SECAM (AV) (DL-SA)
Y-D TIME FOR N358 (AV) (DL-3A)
Y-D TIME FOR N443(AV) (DL-4A)
Y-D TIME FOR B/W (AV) (DL-AV)
*(Y-D : Y-DELAY)
OFFSET ADJ. MODE
COLOUR OFFSET (PAL) (COL-OP)
COLOUR OFFSET (SECAM) (COL-OS)
COLOUR OFFSET (NTSC358) (COL-O3)
COLOUR OFFSET (NTSC443) (COL-O4)
SHARPNESS OFFSET (PAL) (SHP-OP)
SHARPNESS OFFSET (SECAM) (SHP-OS)
SHARPNESS OFFSET (NTSC358) (SHP-O3)
SHARPNESS OFFSET (NTSC443) (SHP-O4)
IC OPTION MODE
VERTICAL SCAN DISABLE(VSD)
BLACK STRETCH (BKS)
AUTO VOLUME LEVELING(AVL)
FAST FILTER IF-PLL(FFI)
ENABLE VERTICAL GUARD (EVG)
EHT TRACKING MODE (EHT)
OVERSCAN SWITCH OFF(OSO)
AUTO COLOUR LIMIT(ACL)
FORCED COLOUR LIMIT(FCO)
MISC. OPTION MODE
SOUND SYSTEM M (S-M)
SOUND SYSTEM DK (S-DK)
SOUND SYSTEM I (S-I)
SOUND SYSTEM BG (S-BG)
PLAYBACK SECAM (P-SECAM)
FE (RF) NTSC 3.58 (F-N358)
FE (RF) NTSC 4.43 (F-N443)
FE (RF) SECAM (F-SECAM)
VIDEO MUTE AT IDENT LOSS (VMI)
VIDEO MUTE AT PROGRAM /SOURCE CHANGE (VMC)
HOTEL MODE (HTL)
REDUCED FM DEMODULATION GAIN FOR BTSC SIGNAL (BTSC)
A
NUMBER OF EXT AV SOURCE (AV)
FM WINDOW SELECTION (FMWS)
SOUND MUTE BIT 0 (SM0)
SOUND MUTE BIT 1 (SM1)
THAI LANGUAGE (THA)
ARABIC LANGUAGE (ARA)
MALAY LANGUAGE (MAL)
CHINESE LANGUAGE (CHI)
FRENCH LANGUAGE (FRE)
RUSSIAN LANGUAGE (RUS)
FORCED V-SYNC SLICING LEVEL(FSL)
SYNC OF OSD (HP2)
TUNER SELECTION (CPT)
B
B
BILINGUAL(BIL)
IF AGC SPEED BIT 0 (AGC0)
IF AGC SPEED BIT 1 (AGC1)
FOA Time Constant-RF (FOA-FE)
FOB Time Constant-RF (FOB-FE)
FOA Time Constant-AV (FOA-AV)
FOB Time Constant-AV (FOB-AV)

USER DATA IN SERVICE MODE

* While SERVICE mode ON, EEPROM DATA will switch to the service data.
  Also, once SERVICE mode OFF, EEPROM will switch back to previous USER DATA.
* In the service mode, the user data establish as below,

MODE	USER DATA
CONTRAST	MIN (1/60)
COLOUR	MIN (1/60)
BRIGHTNESS	MIN (1/60)
TINT	MIN (1/60)
SHARPNESS	MIN (1/60)
WHITE TEMP	STANDARD
S-VOLUME	MIN (1/60)
BLUE BACK	OFF
C SYSTEM	AUTO
S SYSTEM	*1

*1 : For each CH, before changing service mode setting.

The flow of Mode lists as following,

* Direct Key-in Step1 Mode

RC COMMAND	SERVICE-ITEM
FUNCTION	AGC
CONTRAST DOWN	V-LIN
COLOUR DOWN	V-AMP
BRIGHTNESS DOWN	V-CENT
TINT DOWN	H-CENT
SHARPNESS DOWN	EW / /
SYSTEM	HB
BLUEBACK	S-COR
TIMER	SUB-VOL
CONTRAST UP	SUB-CON
COLOUR UP	SUB-COL
BRIGHTNESS UP	SUB-BRI
TINT UP TINT	SUB TINT
SHARPNESS UP	SUB-SHP

After short JA122 & 124, and turn on the main power switch, read data from E²PROM address 00H ~ 03H, and compare to the list below, if different, initialize the E²PROM.

Address	:	Data	Address	:	Data
00H	:	55H	02H	:	43H
01H	:	4FH	03H	:	A1H

EEPROM ITEMS	OSD	DATA LENGTH	INITIAL DATA	FIX/ADJ	REMARK
AGC TAKE OVER POINT	AGC	0~63	14	ADJ	
VERTICAL SLOPE	V-LIN	0~63	32	ADJ	
VERTICAL AMPLITUDE	V-AMP	0~63	32	ADJ	
VERTICAL SHIFT	V-CENT	0~63	32	ADJ	
HORIZONTAL SHIFT	H-CENT	0~63	32	ADJ	
S-CORRECTION	S-COR	0~63	0	FIX	
WHITE POINT RED STD WHITE TEMP	DRI-RS	0~63	32	FIX	
WHITE POINT GREEN STD WHITE TEMP	DRI-GS	0~63	32	ADJ	
WHITE POINT BLUE STD WHITE TEMP	DRI-BS	0~63	32	ADJ	
WHITE POINT RED COOL WHITE TEMP	DRI-RC	0~63	25	ADJ	(DRI-RS)-7 *1
WHITE POINT GREEN COOL WHITE TEMP	DRI-GC	0~63	32	ADJ	(DRI-RS)-7 *1
WHITE POINT BLUE COOL WHITE TEMP	DRI-BC	0~63	32	ADJ	(DRI-BS)
WHITE POINT RED WARM WHITE TEMP	DRI-RW	0~63	32	FIX	(DRI-RS)
WHITE POINT GREEN WARM WHITE TEMP	DRI-GW	0~63	32	ADJ	(DRI-GS)-7
WHITE POINT BLUE WARM WHITE TEMP	DRI-BW	0~63	32	ADJ	(DRI-BS)-7
MAX VOLUME	SUB-VOL	0~63	32	FIX	
SUB CONTRAST	SUB-CON	0~63	63	FIX	
SUB COLOUR	SUB-COL	0~63	32	ADJ	
SUB BRIGHTNESS	SUB-BRI	0~63	32	ADJ	
SUB TINT	SUB-TINT	0~63	32	ADJ	
SUB SHARPNESS	SUB-SHP	0~63	32	FIX	
MAX HOTEL VOLUME	HTL-VOL	0~63	32	FIX	
HOTEL PROGRAM NUMBER	HTL-PRG	0~99 OR>99FOR NONE	255	FIX	
OSD GRB REFERENCE	RGB	0~15	15	FIX	
BLACK LEVEL OFF-SET R	CUT-R	0~15	8	ADJ	
BLACK LEVEL OFF-SET G	CUT-G	0~15	8	ADJ	
CATHODE DRIVE LEVEL	CDL	0~15	0(2)	FIX	*2
Y-DELAY TIME FOR PAL(TV) [YD]	DL-PT	0~15	12	FIX	
Y-DELAY TIME FOR SECAM(TV) [YD]	DL-ST	0~15	15	FIX	
Y-DELAY TIME FOR N358 (TV) [YD]	DL-3T	0~15	12	FIX	
Y-DELAY TIME FOR N443 (TV) [YD]	DL-4T	0~15	12	FIX	
Y-DELAY TIME FOR B/W (TV) [YD]	DL-TV	0~15	12	FIX	
Y-DELAY TIME FOR PAL (AV) [YD]	DL-PA	0~15	12	FIX	
Y-DELAY TIME FOR SECAM (AV) [YD]	DL-SA	0~15	15	FIX	
Y-DELAY TIME FOR N358 (AV) [YD]	DL-3A	0~15	12	FIX	
Y-DELAY TIME FOR N443 (AV) [YD]	DL-4A	0~15	12	FIX	
Y-DELAY TIME FOR B/W (AV) [YD]	DL-AV	0~15	12	FIX	
COLOUR OFFSET (PAL)	COL-OP	0~15	8	FIX	
COLOUR OFFSET (SECAM)	COL-OS	0~15	8	FIX	
COLOUR OFFSET (NTSC358)	COL-O3	0~15	4	FIX	
COLOUR OFFSET (NTSC443)	COL-O4	0~15	4	FIX	
SHARPNESS OFFSET (PAL)	SHP-OP	0~15	8	FIX	
SHARPNESS OFFSET (SECAM)	SHP-OS	0~15	4	FIX	

EEPROM ITEMS	OSD	DATA LENGTH	INITIAL DATA	FIX/ADJ	REMARK
SHARPNESS OFFSET (NTSC358)	SHP-O3	0~15	12	FIX	
SHARPNESS OFFSET (NTSC443)	SHP-O4	0~15	8	FIX	
VERTICAL SCAN DISABLE	VSD	0(DISABLE)/1(ENABLE)	0	FIX	
BLACK STRETCH	BKS	0(DISABLE)/1(ENABLE)	1	FIX	
AUTOMATIC VOLUME LEVELING	AVL	0(DISABLE)/1(ENABLE)	1	FIX	
FAST FILTER IF-PLL	FFI	0(DISABLE)/1(ENABLE)	0	FIX	
ENABLE VERTICAL GUARD (RGB BLANKING)	EVG	0(DISABLE)/1(ENABLE)	1	FIX	ONLY BLK
EHT TRACKING MODE (HCO)	EHT	0(DISABLE)/1(ENABLE)	1	FIX	
OVERSCAN SWITCH OFF	OSO	0(DISABLE)/1(ENABLE)	0	FIX	
AUTO COLOUR LIMIT	ACL	0(DISABLE)/1(ENABLE)	0	FIX	
FORCED COLOUR LIMIT	FCO	0(DISABLE)/1(ENABLE)	0	FIX	
SOUND SYSTEM M	S-M	0(DISABLE)/1(ENABLE)	0	FIX	
SOUND SYSTEM DK	S-DK	0(DISABLE)/1(ENABLE)	1	FIX	
SOUND SYSTEM I	S-I	0(DISABLE)/1(ENABLE)	1	FIX	
SOUND SYSTEM BG	S-BG	0(DISABLE)/1(ENABLE)	1	FIX	
PLAYBACK SECAM	P-SECAM	0(DISABLE)/1(ENABLE)	1	FIX	
FE (RF) NTSC 3.58	F-N358	0(DISABLE)/1(ENABLE)	0	FIX	
FE (RF) NTSC 4.43	F-N443	0(DISABLE)/1(ENABLE)	1	FIX	
FE (RF) SECAM	F-SECAM	0(DISABLE)/1(ENABLE)	1	FIX	
VIDEO MUTE AT IDENT LOSS	VMI	0(DISABLE)/1(ENABLE)	1	FIX	
VIDEO MUTE AT PROGRAM/SOURCE CHANGE	VMC	0(DISABLE)/1(ENABLE)	1	FIX	
HOTEL MODE	HTL	0(DISABLE)/1(ENABLE)	0	FIX	
REDUCED FM DEMODULATOR GAIN FOR BTSC SIGNAL	BTSC	0(DISABLE)/1(ENABLE)	0	FIX	
NUMBER OF EXTERNAL AV SOURCE	AV	0 FOR1 AV/1 FOR 2AV	1	FIX	
FM WINDOW SELECTION	FMWS	0(DISABLE)/1(ENABLE)	0	FIX	
SOUND MUTE BIT 0	SM0	0(DISABLE)/1(ENABLE)	1	FIX	
SOUND MUTE BIT 1	SM1	0(DISABLE)/1(ENABLE)	0	FIX	
THAI LANGUAGE	THA	0(DISABLE)/1(ENABLE)	0	FIX	
ARABIC LANGUAGE	ARA	0(DISABLE)/1(ENABLE)	1	FIX	
MALAY LANGUAGE	MAL	0(DISABLE)/1(ENABLE)	1	FIX	
CHINESE LANGUAGE	CHI	0(DISABLE)/1(ENABLE)	1	FIX	
FRENCH LANGUAGE	FRE	0(DISABLE)/1(ENABLE)	1	FIX	
RUSSIAN LANGUAGE	RUS	0(DISABLE)/1(ENABLE)	1	FIX	
FORCED V-SYNC SLICING LEVEL	FSL	0(DISABLE)/1(ENABLE)	0	FIX	
SYNC OF OSD	HP2	0(DISABLE)/1(ENABLE)	0	FIX	
TUNER SELECTION (0:SHARP/ALPS;1:MURATA)	CPT	0(DISABLE)/1(ENABLE)	0	FIX	
BILINGUAL	BIL	0(DISABLE)/1(ENABLE)	0	FIX	
IF AGC SPEED BIT 0	AGC0	0(DISABLE)/1(ENABLE)	1	FIX	
IF AGC SPEED BIT 1	AGC1	0(DISABLE)/1(ENABLE)	0	FIX	
PHI-1 TIME CONSTANT (RF)	FOA-FE	0(DISABLE)/1(ENABLE)	0	FIX	
PHI-1 TIME CONSTANT (RF)	FOB-FE	0(DISABLE)/1(ENABLE)	0	FIX	
PHI-1 TIME CONSTANT (OFF AIR)	FOA-AV	0(DISABLE)/1(ENABLE)	1	FIX	
PHI-1 TIME CONSTANT (OFF AIR)	FOB-AV	0(DISABLE)/1(ENABLE)	1	FIX	

Note :

Fixed data, please do not change without specific instruction.

*1:White point RED and GREEN COOL WHITE TEMP for 18000 degree colour TEMP (SMEF MODELS) MINUS 5. other models (123K degree colour temp) still same MINUS 7.

*2:CDL initial data=2 for all 20" & 21" only.

INITIAL SETTING

(1) In service mode, After execute select POS 1, store the following tuning data in E²PROM.

MCL1			MCL2		
CH-No.	Fv (MHz)	SOUND SYS	CH-No.	Fv (MHz)	SOUND SYS
0			0	590.25	B/G
1	48.25	B/G	1	46.25	B/G
2	62.25	B/G	2	64.25	B/G
3	77.25	D/K	3	86.25	B/G
4	175.25	B/G	4	95.25	B/G
5	182.25	B/G	5	138.25	B/G
6	183.25	D/K	6	175.25	B/G
7	191.25	D/K	7	182.25	B/G
8	196.25	B/G	8	189.25	B/G
9	199.25	M	9	196.25	B/G
10	210.25	B/G	10	209.25	B/G
11	224.25	B/G	11	216.25	B/G
12	471.25	B/G	12		B/G
13	487.25	I	13		
14	503.25	B/G	14		
15	575.25	B/G	15		
16	583.25	B/G	16		
17	599.25	B/G	17		
18	621.25	M	18	527.25	B/G
19	639.25	D/K	19	847.25	B/G
20	703.25	B/G	20	48.25	B/G
21	735.25	I	21	175.25	B/G
22	767.25	B/G	22	210.25	B/G
23	815.25	B/G	23	224.25	B/G
24	855.25	I	24	575.25	B/G
25	855.25	B/G	25	599.25	B/G
26	55.25	M	26	767.25	B/G
27	83.25	M	27	183.25	M
28	183.25	M	28	193.25	M
29	193.25	M	29	112.25	B/G
30	217.25	M	30	168.25	B/G
31	471.25	M	31		
32	477.25	M	32	294.25	B/G
33	693.25	M	33	463.25	B/G
34			34	174.95	B/G
35	112.25	B/G	35	175.55	B/G
36	168.25	B/G	36		
37			37	599.25	B/G
38	294.25	B/G	38		
39	463.25	B/G	39		
40			40		
41	647.25	B/G	41		
42	663.25	B/G	42		
43	679.25	B/G	43		
44	174.95	B/G			
45	175.55	B/G			

SHIPPING SETTING & CHECKING

(1) The following default data has been factory-set for the E²PROM.

ITEMS	DATA SETTING
LAST PROGRAM/CHANNEL	1
FLASHBACK PROGARM/CH	1
DIGIT	1
C-SYSTEM	AUTO
S-SYSTEM	*1
SKIP	OFF
AFC	ON
VOLUME	1
CONTRAST	60 (MAX)
COLOUR	0 (CENTER)
BRIGHTNESS	0 (CENTER)
TINT	0 (CENTER)
SHARPNESS	0 (CENTER)
WHITE TEMP	STANDARD
REMINDER TIMER	In-active, "--:--"
ON TIMER	In-active, "--:--"
OFF TIMER	In-active, "--:--"
LAST POWER	POWER-ON
LANGUAGE	*1
BLUE BACK MUTE	OFF
HOTEL MODE	OFF
0 CHANNEL SKIP	ON

*1: Please refer defaults for LANGUAGE and SOUND SYSTEM per MODEL as follows,

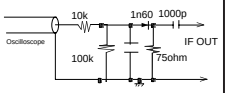
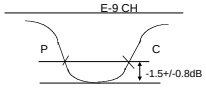
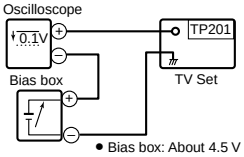
MODEL	LANGAUGE	SOUND SYSTEM
3	ENGLISH	B/G
4	ARABIC	B/G

FACTORY SETTINGS BY MODELS
(Reference: Geomagnetism Adjustment)

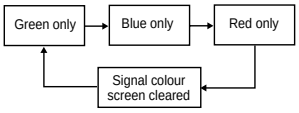
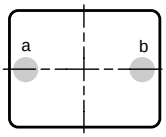
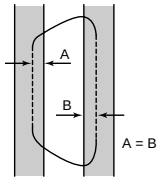
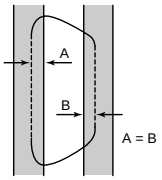
MODEL	Magnetic filed (V,H) nT		Background	Lang.	S-SYS
F	-10,000	40,000	12,300°K	ENGLISH	B/G
G	30,000	20,000	18,000°K	ARABIC	B/G
*G (Africa)	-10,000	40,000	12,300°K	ENGLISH	B/G
Y	10,000	40,000	12,300°K	ENGLISH	B/G

*Note for OSD type
*OSD Lang. must be set in service mode, but it's better to write in E²PROM.
Language quantities are 6 as below:
English/Chinese/French/Arabic/Malay/Russian

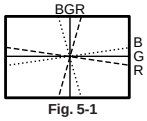
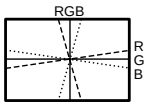
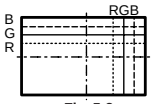
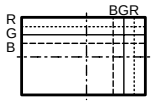
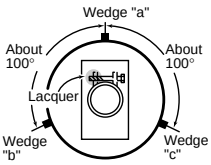
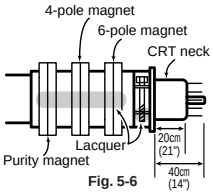
PIF ADJUSTMENT

NO.	Adjustment part	Adjusting procedure and conditions	Waveform and others
1	**TUNER IFT (PRESET)**	1. Get the tuner ready to receive the E-9 CH signal, but with no signal input. Adjust the PLL data. 2. Connect the sweep generator's output cable to the tuner antenna. (RF SWEEP) 3. Adjust the sweep generator's to 80dBµV. 4. Connect the response lead (use LOW IMPEDANCE probe with wave detector; see **Fig.1**) to the tuner's IF output terminal. (This terminal must have the probe alone connected). 5. Set the RF AGC to 0 - 6 V with no saturation with the waveform. 6. Adjust the tuner IF coil to obtain the waveform as shown in **Fig. 2**. **Note: Be sure to keep the tuner cover in position during this adjustment.**	 **Fig. 1**  **Fig. 2**
2	**RF-AGC TAKE OVER POINT ADJUSTMENT (I²C BUS CONTROL)**	1. Receive "PAL COLOUR BAR" signal. ● Signal Strength: 57 ±1 dBµV (75 ohm open) 2. Connect the oscilloscope to TP201 (Tuner's AGC Terminal) as shown in **Fig. 3**.  ● Bias box: About 4.5 V **Fig. 3** 3. Call "AGC" mode in service mode. Adjust the "AGC" bus data to obtain the Tuner output pin drop 0.1 V below maximum voltage. 4. Change the antenna input signal to 63~67dBµV, and make sure there is no noise. 5. Turn up the input signal to 90~95 dBµV to be sure that there is no cross modulation beat.	**Note:** **For the 50 ohm signal strength gauge, when not using 50/75 impedance adapter, signal strength is 52 ±1 dBµV(75 ohm open), instead of 57 ±1 dBµV (75 ohm open).** **Precaution:** **The loss of using impedance adapter**

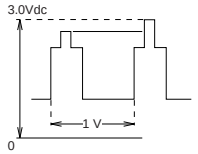
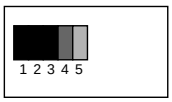
PURITY ADJUSTMENT

NO.	Adjustment part	Adjusting procedure and conditions	Waveform and others
1	**PURITY ADJUSTMENT**	1. Receive the GREEN-ONLY signal. Adjust the beam current to ~700 µA (21" & 20")/~500 µA (14"). 2. Degauss the CRT enough with the degausing coil. Note: Follow the Job Instruction Sheet to adjust the magnetic field. **Vertical Bv : +0.030 mT (0.30 gauss)** **Horizontal Bh : +0.020 mT (0.20 gauss)** (Reference: page 8/21) 3. Maintain the purity magnet at the zero magnetic field and keep the static convergence roughly adjusted. 4. Observe the points a, b as shown in **Fig. 4-1** through the microscope. Adjust the landings to the rank A requirements. 5. Orient the raster rotation to 0 eastward. 6. Tighten up the deflection coil screws. ● Tightening torque: 108 ± 20 N (11 ±2 kgf) 7. Make sure the CRT corners landing meet the A rank requirements. If not, stick the magnet sheet to correct it. **Note: This adjustment must be done after warming up the unit for 30 minutes or longer with a beam current over 700 µA. (21" & 20")** **(For 14", the beam current should be over 500 µA).** **Note: Set the service mode by JA122 & JA124 (short) then press factory process R/C RGB key to change to RGB mono colour mode.** * For the following colours press R/C RGB key to change. 	 **Fig. 4-1**  **Fig. 4-2** Rank "A" (on the right of the CRT)  **Fig. 4-3** Rank "A" (on the left of the CRT) * Press R/C RGB key for 1 second in NORMAL MODE, the colour will change to RGB mono colour mode. Text Key "R.G.Cy"" Key can be directly use to change to other colours screen.

CONVERGENCE ADJUSTMENT

NO.	Adjustment part	Adjusting procedure and conditions	Waveform and others
1	**CONVERGENCE ADJUSTMENT (To be done after the purity adjustment.)**	1. Receive the "Crosshatch Pattern" signal. 2. Using the remote controller, call NORMAL mode. **Static convergence** 1. Turn the 4-pole magnet to a proper opening angle in order to superpose the blue and red colours. 2. Turn the 6-pole magnet to a proper opening angle in order to superpose the green colour over the blue and red colours. **Dynamic convergence** 1. Adjust the convergence on the fringes of the screen in the following steps. **a) Fig. 5-1: Drive the wedge at point "a" and swing the deflection coil upward.** **b) Fig. 5-2: Drive the wedge at points "b" and "c" and swing the deflection coil downward.** **c) Fig. 5-3: Drive the "c" wedge deeper and swing the deflection coil rightward.** **d) Fig. 5-4: Drive the "b" wedge deeper and swing the deflection coil leftward.** 2. Fix all the wedges on the CRT and apply glass tape over them. 3. Apply lacquer to the deflection yoke lock screw, magnet unit (purity, 4-pole, 6-pole magnets) and magnet unit lock screw. Finally received the Red-only and Blue-only signals to make sure there is no other colours on the screen.	 **Fig. 5-1**  **Fig. 5-2**  **Fig. 5-3**  **Fig. 5-4**  **Fig. 5-5**  **Fig. 5-6**

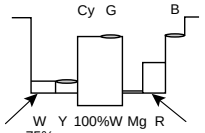
CRT CUT-OFF, BACKGROUND AND SUB-CONTRAST ADJUSTMENT

NO.	Adjustment part	Adjusting procedure and conditions	Waveform and others
1	**CRT CUTOFF ADJUSTMENT (I²C BUS CONTROL)**	1. Switch TV to VIDEO mode, BLUE BACK OFF, with NO VIDEO signal. 2. Press R/C to set Picture Normal condition. 3. Connect the oscilloscope to Red OUT from IC801.(TP851 (14")/TP852 (20"/21")) Range : 1 V/Div (DC) Sweep : 5 msec/Div 4. Adjust SCREEN VR, so that the tip of signal reach 3.0 ±0.1 Vdc.	 **Fig. 6**
2	**SUB-BRIGHTNESS ADJUSTMENT (I²C BUS CONTROL)**	1. Call "SUB-BRI" in service mode. (Receive Crosshatch pattern with 5 black level windows) 2. Adjust the "SUB BRIGHT" bus data in order that the line 1, 2 and 3 have the same darkness wherelse line 4 is slightly brighter than line 1, 2 and 3 and finally line 5 will be the brighter than line 4.	 1, 2 and 3 are in same black level. **Fig. 7**
3	**WHITE BALANCE SERVICE MODE ADJUSTMENT (I²C BUS CONTROL)**	1. Receive the "WHITE" pattern with BURST signal. 2. Press R/C to set Picture NORMAL condition. 3. Connect the DC miliammeter between TP602 (-) and TP603 (+). 4. Check Beam current should be around 1,100 µA (20"&21") (14" around 800 µA). 5. Set it to service mode and adjust the DRI-GS, & DRI-BS data to have a colour temperature of 12,300°K or 7,500°K (white). *** Note** . 6. Receive "WHITE" pattern, WITH BURST signal, and set BRIGHTNESS Y by generator, to ** 10 cd/m2 (MINOLTA CA-100) by reducing LUMINATE Y signal. 7. Adjust "CUT-R" & "CUT-G" to get desired colour temperature. Then go back NORMAL mode (HIGH BRIGHT**) to check colour temperature. If out 14" back to (1) **Note: This adjustment must be done after warming up the unit for 30 minutes or longer with a beam current over 700 µA. (20"&21")** **(For 14", the beam current should be over 500 µA)** * Adjust DRI-GC/GW, DR-BC/BW as following data, after finishing DRI-BS and DRI-GS data adjustment. DRI-RW=32 (FIXED), DRI-GW="DRI-GS"-7*, DRI-BW="DRI-BS"-7* DRI-RC=25, DRI-BC="DRI-BS", DRI-GC="DRI-GS"-7*	Refer to Page ????. * 12,300°K X : 0.272 Y : 0.275 * 18,000°K X : 0.255 Y : 0.255 (MINOLTA COLOUR ANALYZER CA-100) ***Note: Above Data can be UP/DOWN by Volume key.** LOW HIGH 14" 10 cd/m2 200 cd/m2 20"/21" 10 cd/m2 120 cd/m2 * 12,300°K DRI-GW="DRI-GS"-7 DRI-BW="DRI-BS"-7 * 18,000°K DRI-GC="DRI-GS" DATA-5 DRI-RC=27
4	**MAXIMUM BEAM CHECK**	1. Receive the "Monoscope Pattern" signal. 2. Press R/C to set Picture NORMAL condition. 3. Connect the DC miliammeter between TP603 (+) and TP602 (–). (Full Scale: 3 mA Range) 4. Beam current must be within 1,100 ±100µA (21") 800 ± 100 µA(14") .	

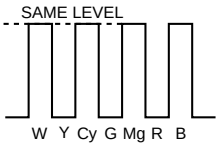
HORIZONTAL, VERTICAL, DEFLECTION LOOP AND FOCUS ADJUSTMENT

NO.	Adjustment part	Adjusting procedure and conditions	Waveform and others
1	**V-SLOPE (I²C BUS CONTROL)**	1. Receive Monoscope Pattern Signal. 2. Call the "V-LIN" mode. 3. Increase or decrease "V-LIN" by Volume key till the horizontal line in the center of monoscope is just at the position where the blanking starts.	
2	**V-SHIFT-50 (I²C BUS CONTROL)**	1. Call the "V-CENT" mode. 2. Increase or decrease "V-CENT" by Volume key till the picture is centered.	
3	**V-AMP 50 (I²C BUS CONTROL)**	1. Call the "V-AMP" mode. 2. Increase or decrease "V- AMP" by Volume key to set overscan of 9.5% typical. Adjustment Spec 9.5% range +1% -0%.	
4	**S-CORRECTION (I²C BUS CONTROL)**	**FIXED DATA, NO NEED TO ADJUST.**	
5	**H-SHIFT (50) (H-CENTER) (I²C BUS CONTROL)**	1. Call the "H-CENT" mode. 2. Increase or decrease "H-CENT" by Volume key to center the picture horizontal.	
1	**FOCUS ADJUSTMENT**	1. Receive the "Monoscope Pattern" signal. 2. Press R/C to set Picture NORMAL condition. 3. Adjust the focus control to get the best focusing.	

PAL CHROMA ADJUSTMENT

NO.	Adjustment part	Adjusting procedure and conditions	Waveform and others
1	**SUB COLOUR (I²C BUS CONTROL)**	1. Receive the "PAL Colour Bar" signal. 2. Press R/C to set Picture Normal condition. 3. Connect the oscilloscope to Red cathode. ● Range : 20 V/Div. (AC) (Use 10:1 probe) ● Sweep time : 10 µsec/Div. 4. Using the R/C call "SUB COL" in SERVICE mode. Adjust SUB COLOUR bus data, so that the 75% White & Red portions of PAL Colour Bar be at the same level shown as **Fig. 8**. 5. Clear the SERVICE mode.	 **Fig. 8**

NTSC CHROMA ADJUSTMENT

NO.	Adjustment part	Adjusting procedure and conditions	Waveform and others
1	**SUB-TINT (I²C BUS CONTROL)**	1. Receive the "NTSC 3.58 Colour Bar" signal thru AV in. 2. Connect the oscilloscope to TP853 (Pin (5) of P882) BLUE-OUT. ● Range : 100 mV/Div. (AC) (Use Probe 10:1) ● Sweep time : 10 µsec/Div. 3. Call the "SUB-TINT" mode in service mode. Adjust the "SUB-TINT" bus data to obtain the waveform shown as **Fig. 9**. 4. Clear the SERVICE mode.	 **Fig. 9**

PROTECTOR OPERATION CHECKING

NO.	Adjustment part	Adjusting procedure and conditions	Waveform and others
1	**BEAM PROTECTOR**	1. Receive "Monoscope Pattern" signal. 2. Set CONTRAST MAX. 3. Set BRIGHT MAX. 4. During the Collector & Emitter of Q883/5/7 short, make sure the protector ON and switch to standby mode.	* Select one of Q883/5/7 to do each short test.
2	**H, V PROTECTOR**	1. Receive "Monoscope Pattern" signal. 2. Connect output of Bias Box to D607 cathode (R606 side). 3. Set voltage of Bias Box to 18V and make sure the protector is not work. 4. Set voltage of Bias Box to 27V, and make sure the protector is work.	
3	**OTHER PROTECTOR**	1. Once finish rectified Electrolytic Capacitor short testing in +B line, check all possible damaged components on +B line. (Use random selected set for inspection)	

A/V INPUT AND OUTPUT CHECKING

NO.	Adjustment part	Adjusting procedure and conditions	Waveform and others
1	**VIDEO AND AUDIO OUTPUT CHECK**	1. Receive the "PAL Colour Bar" signal (100% White Color Bar, Sound 400 Hz 100% Mod C475.) 2. Terminate the Video output with a 75 ohm impedance. Make sure the output is as specified (1.0 Vp-p ±3 dB). 3. Terminate the Audio output with a 10K ohm impedance. Make sure the output is as specified (1.76 Vp-p ±3 dB).	
2	**VIDEO AND AUDIO INPUT CHECK**	1. Using the TV/AV key on the remote controller, make sure that the modes change in order of TV, AV1, AV2 & TV again and the video & audio output are according to the input terminal for each mode.	

FUNCTION OPERATION CHECKING (VIDEO AND AUDIO)

NO.	Adjustment part	Adjusting procedure and conditions	Waveform and others
1	**CONTRAST KEY**	1. Receive "Monoscope Pattern" signal. 2. Set P-Mode to select CONTRAST. 3. Press Volume Up/Down key to check whether the CONTRAST effect is OK or not.	
2	**COLOUR KEY**	1. Receive "Colour Bar" signal. 2. Set P-Mode to select COLOUR. 3. Press Volume Up/Down key to check whether the COLOUR effect is OK or not.	
3	**BRIGHTNESS KEY**	1. Receive "Monoscope Pattern" signal. 2. Set P-Mode to select BRIGHTNESS. 3. Press Volume Up/Down key to check whether the BRIGHTNESS effect is OK or not	
4	**TINT KEY**	1. Receive the "NTSC Colour Bar" signal thru AV in. 2. Set P-Mode to select TINT. 3. Press Volume Up/Down key to check TINT, UP for GREEN direction and DOWN for PURPLE direction whether is OK or not.	
5	**SHARPNESS KEY**	1. Receive "Monoscope Pattern" signal. 2. Set P-mode to select SHARPNESS. 3. Press Volume Up/Down key to check whether the SHARPNESS effect is OK or not.	
6	**CH DISPLAY COLOUR**	1. All Ch (1~99) will have an OSD display of the channel number in green colour under AFT ON condition.	
7	**NORMAL KEY**	1. Once in PICTURE Mode, and the NORMAL key is pressed, all the settings will be present to normal setting. (Normal setting value for every mode). ● CONTRAST : MAX ● COLOUR : CENTER ● BRIGHTNESS : CENTER ● TINT : CENTER ● SHARPNESS : CENTER	**Note: If nothing is display mean contrast, colour, bright, tint or sharpness are all in normal setting.**
8	**WHITE TEMP**	1. Receive "Monoscope Pattern" signal. 2. Set FUNCTION to select WHITE TEMP. 3. Press Volume Up/Down key to check WHITE TEMP Option, STANDARD: NORMAL SETTING, WARM for more REDDISH direction changing, COOL for more BLUISH direction changing.	

FUNCTION OPERATION CHECKING (VIDEO AND AUDIO) (Continued)

NO.	Adjustment part	Adjusting procedure and conditions	Waveform and others
9	**COLOUR SYSTEM**	1. Receive the "PAL COLOUR BAR" signal, press the COLOUR SYSTEM key to select modes except PAL, check the COLOUR is not working properly. Then, select the "PAL" mode. Check again its colour so that it is working properly. 2. Receive "SECAM COLOUR BAR" signal, press COLOUR SYSTEM key to select modes except SECAM, check the COLOUR is not working properly. Then, select the "SECAM" mode. Check again its colour so that it is working properly. 3. Receive "NTSC 4.43/3.58 COLOUR BAR" signal thru AV, press COLOUR SYSTEM key to select modes except N4.43/3.58, check the COLOUR is not working properly. Then, select the "NTSC 4.43/3.58" mode. Check again its colour so that it is working properly.	
10	**SOUND SYSTEM**	1. Receive "PAL-D/K" signal, press the "SOUND SYSTEM" turn to B/G, I. Check the sound output is not working properly. Select D/K and check the sound output to make sure it is working properly. 2. Receive "PAL-I" signal, press the "SOUND SYSTEM" to select B/G, D/K. Check the sound output is not working properly. Select I and check the sound output to make sure it is working properly. 3. Receive "PAL-B/G" signal, press the "SOUND SYSTEM" to select I, D/K. Check the sound output is not working properly. Select B/G and check the sound output to make sure it is working properly.	
11	**NOISE MUTE CHECKING**	1. Receive "PAL COLOUR BAR" signal. 2. Turn up the volume control to maximum, make sure the sound is heard from the speakers. Then put the unit in no signal state. 3. Check the sound mute is effective. 4. Finally turn sound level of CTV to minimum.	
12	**OSD LANGUAGE QUANTITY CHECK**	There are six language as below; English, Russian, Chinese, French, Arabic and Malay.	

MEMORY MAP

ADDRESS	DATA								MICON	EEPROM	EEPROM	CHASSIS		CTV FINAL		LAST INITIAL	
(HEX)	D7	D6	D5	D4	D3	D2	D1	D0	DEFAULT	RANGE	WRITE(CPU)	CHECK DATA	CHECK TYPE	CHECK DATA	CHECK TYPE	SETTING DATA	REMARK
00	PASS WORD								55	00-FF							
01	PASS WORD								4F	00-FF							
02	PASS WORD								43	00-FF							
03	PASS WORD								A1	00-FF							
04																	
05																	
06	AGC TAKE-OVER								0E	00-3F							
07	V-SLOPE								20	00-3F							
08	V-AMPLITUDE								20	00-3F							
09	V-CENTER								20	00-3F							
0A	H-CENTER								20	00-3F							
0B	H-SIZE								20	00-3F							
0C	EW-PARALLELOGRAM								20	00-3F							
0D	EW-PARABOLA-WIDTH								20	00-3F							
0E	EW-UPPER CORNER								20	00-3F							
0F	EW-LOWER CORNER								20	00-3F							
10	EW-TRAPEZIUM								20	00-3F							
11	HORIZONTAL-BOW								20	00-3F							
12	S-CORRECTION								00	00-3F							
13																	
14																	
15																	
16	DRIVE-R (STANDARD)								20	00-3F							
17	DRIVE-G (STANDARD)								20	00-3F							
18	DRIVE-B (STANDARD)								20	00-3F							
19	DRIVE-R (WARM)								20	00-3F							
1A	DRIVE-G (WARM)								20	00-3F							
1B	DRIVE-B (WARM)								20	00-3F							
1C	DRIVE-R (COOL)								19	00-3F							
1D	DRIVE-G (COOL)								20	00-3F							
1E	DRIVE-B (COOL)								20	00-3F							
1F																	
20																	
21																	
22	SUB-VOLUME								3F	00-3F							
23	SUB-CONTRAST								3F	00-3F							
24	SUB-COLOUR								20	00-3F							
25	SUB-BRIGHTNESS								20	00-3F							
26	SUB-TINT								20	00-3F							
27	SUB-SHARPNESS								20	00-3F							
28	HTL-VOLUME								20	00-3F							
29	HTL-POSITION								FF	00-FF							
2A																	
2B																	
2C																	
2D	OSD-REFERENCE								0F	00-0F							
2E	CUTOFF LEVEL -OFFSET R								08	00-0F							
2F	CUTOFF LEVEL -OFFSET B								08	00-0F							
30	CATHODE DRIVE LEVEL								00	00-0F							
31	Y-DELAY (TV PAL)								0C	00-0F							
32	Y-DELAY (TV SECAM)								0F	00-0F							
33	Y-DELAY (TV N358)								0C	00-0F							
34	Y-DELAY (TV N443)								0C	00-0F							
35	Y-DELAY (TV BW)								0C	00-0F							
36	Y-DELAY (AV PAL)								0C	00-0F							
37	Y-DELAY (AV SECAM)								0F	00-0F							
38	Y-DELAY (AV N443)								0C	00-0F							
39	Y-DELAY (AV N358)								0C	00-0F							
3A	Y-DELAY (AV BW)								0C	00-0F							
3B	COLOUR-OFFSET (PAL)								08	00-0F							
3C	COLOUR-OFFSET (SECAM)								08	00-0F							
3D	COLOUR-OFFSET (N443)								04	00-0F							
3E	COLOUR-OFFSET (N358)								04	00-0F							
3F	SHARPNESS-OFFSET (PAL)								08	00-0F							
MODEL									MODEL								
LETTER NO.									LETTER NO.								

ADDRESS	DATA								MICON	EEPROM	EEPROM	CHASSIS		CTV FINAL		LAST INITIAL	
(HEX)	D7	D6	D5	D4	D3	D2	D1	D0	DEFAULT	RANGE	WRITE(CPU)	CHECK DATA	CHECK TYPE	CHECK DATA	CHECK TYPE	SETTING DATA	REMARK
40					SHARPNESS-OFFSET (SECAM)				04	00-0F							
41					SHARPNESS-OFFSET (N443)				0C	00-0F							
42					SHARPNESS-OFFSET (N358)				08	00-0F							
43																	
44	FCO	ACL	OSO	EHT	EVG	FFI	AVL	BKS		00-FF							
45	SCM	N443	N358	PB-SEC	BG	I	DK	M		00-FF							
46	SM		FMWS	AV	BTSC	HTL	VMC	VMI		00-FF							
47	HP2	FSL	RUS	FRA	CHN	MLY	ARB	THA		00-FF							
48					AGC		BIL	OBA		00-FF							
49																	
4A																	
4B																	
4C	VOLUME								01	00-3C							
4D	CONTRAST								3C	00-3C							
4E	COLOUR								1E	00-3C							
4F	BRIGHTNESS								1E	00-3C							
50	TINT								1E	00-3C							
51	SHARPNESS								1E	00-3C							
52																	
53																	
54																	
55	POSITION/AV1/AV2								01	00-FF							
56	FAV-POS A								0A	00-FF							
57	FAV-POS B								14	00-FF							
58	FAV-POS C								1E	00-FF							
59	FAV-POS D								28	00-FF							
5A																	
5B																	
5C	POWER								00	00-01							
5D	WHITE-TEMP								00	00-02							
5E	BLUE BACK								00	00-01							
5F	LANGUAGE								00	00-07							
60	DIGIT								00	00-01							
61																	
62	SKIP 0	SKIP 1	SKIP 2	SKIP 3	SKIP 4	SKIP 5	SKIP 6	SKIP 7	80	00-FF							
63	SKIP 8	SKIP 9	SKIP 10	SKIP 11	SKIP 12	SKIP 13	SKIP 14	SKIP 15	00	00-FF							
64	SKIP 16	SKIP 17	SKIP 18	SKIP 19	SKIP 20	SKIP 21	SKIP 22	SKIP 23	00	00-FF							
65	SKIP 24	SKIP 25	SKIP 26	SKIP 27	SKIP 28	SKIP 29	SKIP 30	SKIP 31	00	00-FF							
66	SKIP 32	SKIP 33	SKIP 34	SKIP 35	SKIP 36	SKIP 37	SKIP 38	SKIP 39	00	00-FF							
67	SKIP 40	SKIP 41	SKIP 42	SKIP 43	SKIP 44	SKIP 45	SKIP 46	SKIP 47	00	00-FF							
68	SKIP 48	SKIP 49	SKIP 50	SKIP 51	SKIP 52	SKIP 53	SKIP 54	SKIP 55	00	00-FF							
69	SKIP 56	SKIP 57	SKIP 58	SKIP 59	SKIP 60	SKIP 61	SKIP 62	SKIP 63	00	00-FF							
6A	SKIP 64	SKIP 65	SKIP 66	SKIP 67	SKIP 68	SKIP 69	SKIP 70	SKIP 71	00	00-FF							
6B	SKIP 72	SKIP 73	SKIP 74	SKIP 75	SKIP 76	SKIP 77	SKIP 78	SKIP 79	00	00-FF							
6C	SKIP 80	SKIP 81	SKIP 82	SKIP 83	SKIP 84	SKIP 85	SKIP 86	SKIP 87	00	00-FF							
6D	SKIP 88	SKIP 89	SKIP 90	SKIP 91	SKIP 92	SKIP 93	SKIP 94	SKIP 95	00	00-FF							
6E	SKIP 96	SKIP 97	SKIP 98	SKIP 99					00	00-FF							
6F																	
70																	
71																	
72																	
73																	
74	TUNING FREQUENCY (HIGHER PART)										S-SYS						POS 0
75	TUNING FREQUENCY (LOWER PART)										000:BG						
76	S-SYS			AFT	(auto)			C-SYS			001:I						
77	TUNING FREQUENCY (HIGHER PART)										O1O:DK						POS 1
78	TUNING FREQUENCY (LOWER PART)										011:M						
79	S-SYS			AFT	(auto)			C-SYS									
7A	TUNING FREQUENCY (HIGHER PART)										AFT						POS 2
7B	TUNING FREQUENCY (LOWER PART)										0:OFF						
7C	S-SYS			AFT	(auto)			C-SYS			1:ON						
7D	TUNING FREQUENCY (HIGHER PART)																POS 3
7E	TUNING FREQUENCY (LOWER PART)																
7F	S-SYS			AFT	(auto)			C-SYS									
MODEL									MODEL								
LETTER NO.									LETTER NO.								

ADDRESS	DATA								MICON	EEPROM	EEPROM	CHASSIS		CTV FINAL		LAST INITIAL	REMARK
(HEX)	D7	D6	D5	D4	D3	D2	D1	D0	DEFAULT	RANGE	WRITE(CPU)	CHECK DATA	CHECK TYPE	CHECK DATA	CHECK TYPE	SETTING DATA	
80	TUNING FREQUENCY (HIGHER PART)																POS 4
81	TUNING FREQUENCY (LOWER PART)																
82	S-SYS			AFT		(auto)		C-SYS									
83	TUNING FREQUENCY (HIGHER PART)																POS 5
84	TUNING FREQUENCY (LOWER PART)																
85	S-SYS			AFT		(auto)		C-SYS									
86	TUNING FREQUENCY (HIGHER PART)																POS 6
87	TUNING FREQUENCY (LOWER PART)																
88	S-SYS			AFT		(auto)		C-SYS									
89	TUNING FREQUENCY (HIGHER PART)																POS 7
8A	TUNING FREQUENCY (LOWER PART)																
8B	S-SYS			AFT		(auto)		C-SYS									
8C	TUNING FREQUENCY (HIGHER PART)																POS 8
8D	TUNING FREQUENCY (LOWER PART)																
8E	S-SYS			AFT		(auto)		C-SYS									
8F	TUNING FREQUENCY (HIGHER PART)																POS 9
90	TUNING FREQUENCY (LOWER PART)																
91	S-SYS			AFT		(auto)		C-SYS									
92	TUNING FREQUENCY (HIGHER PART)																POS 10
93	TUNING FREQUENCY (LOWER PART)																
94	S-SYS			AFT		(auto)		C-SYS									
95	TUNING FREQUENCY (HIGHER PART)																POS 11
96	TUNING FREQUENCY (LOWER PART)																
97	S-SYS			AFT		(auto)		C-SYS									
98	TUNING FREQUENCY (HIGHER PART)																POS 12
99	TUNING FREQUENCY (LOWER PART)																
9A	S-SYS			AFT		(auto)		C-SYS									
9B	TUNING FREQUENCY (HIGHER PART)																POS 13
9C	TUNING FREQUENCY (LOWER PART)																
9D	S-SYS			AFT		(auto)		C-SYS									
9E	TUNING FREQUENCY (HIGHER PART)																POS 14
9F	TUNING FREQUENCY (LOWER PART)																
A0	S-SYS			AFT		(auto)		C-SYS									
A1	TUNING FREQUENCY (HIGHER PART)																POS 15
A2	TUNING FREQUENCY (LOWER PART)																
A3	S-SYS			AFT		(auto)		C-SYS									
A4	TUNING FREQUENCY (HIGHER PART)																POS 16
A5	TUNING FREQUENCY (LOWER PART)																
A6	S-SYS			AFT		(auto)		C-SYS									
A7	TUNING FREQUENCY (HIGHER PART)																POS 17
A8	TUNING FREQUENCY (LOWER PART)																
A9	S-SYS			AFT		(auto)		C-SYS									
AA	TUNING FREQUENCY (HIGHER PART)																POS 18
AB	TUNING FREQUENCY (LOWER PART)																
AC	S-SYS			AFT		(auto)		C-SYS									
AD	TUNING FREQUENCY (HIGHER PART)																POS 19
AE	TUNING FREQUENCY (LOWER PART)																
AF	S-SYS			AFT		(auto)		C-SYS									
B0	TUNING FREQUENCY (HIGHER PART)																POS 20
B1	TUNING FREQUENCY (LOWER PART)																
B2	S-SYS			AFT		(auto)		C-SYS									
B3	TUNING FREQUENCY (HIGHER PART)																POS 21
B4	TUNING FREQUENCY (LOWER PART)																
B5	S-SYS			AFT		(auto)		C-SYS									
B6	TUNING FREQUENCY (HIGHER PART)																POS 22
B7	TUNING FREQUENCY (LOWER PART)																
B8	S-SYS			AFT		(auto)		C-SYS									
B9	TUNING FREQUENCY (HIGHER PART)																POS 23
BA	TUNING FREQUENCY (LOWER PART)																
BB	S-SYS			AFT		(auto)		C-SYS									
BC	TUNING FREQUENCY (HIGHER PART)																POS 24
BD	TUNING FREQUENCY (LOWER PART)																
BE	S-SYS			AFT		(auto)		C-SYS									
BF	TUNING FREQUENCY (HIGHER PART)																POS 25
MODEL									MODEL								
LETTER NO.									LETTER NO.								

ADDRESS	DATA								MICON	EEPROM	EEPROM	CHASSIS		CTV FINAL		LAST INITIAL	REMARK
(HEX)	D7	D6	D5	D4	D3	D2	D1	D0	DEFAULT	RANGE	WRITE(CPU)	CHECK DATA	CHECK TYPE	CHECK DATA	CHECK TYPE	SETTING DATA	
C0	TUNING FREQUENCY (LOWER PART)																POS 25
C1	S-SYS			AFT		(auto)		C-SYS									
C2	TUNING FREQUENCY (HIGHER PART)																POS 26
C3	TUNING FREQUENCY (LOWER PART)																
C4	S-SYS			AFT		(auto)		C-SYS									
C5	TUNING FREQUENCY (HIGHER PART)																POS 27
C6	TUNING FREQUENCY (LOWER PART)																
C7	S-SYS			AFT		(auto)		C-SYS									
C8	TUNING FREQUENCY (HIGHER PART)																POS 28
C9	TUNING FREQUENCY (LOWER PART)																
CA	S-SYS			AFT		(auto)		C-SYS									
CB	TUNING FREQUENCY (HIGHER PART)																POS 29
CC	TUNING FREQUENCY (LOWER PART)																
CD	S-SYS			AFT		(auto)		C-SYS									
CE	TUNING FREQUENCY (HIGHER PART)																POS 30
CF	TUNING FREQUENCY (LOWER PART)																
D0	S-SYS			AFT		(auto)		C-SYS									
D1	TUNING FREQUENCY (HIGHER PART)																POS 31
D2	TUNING FREQUENCY (LOWER PART)																
D3	S-SYS			AFT		(auto)		C-SYS									
D4	TUNING FREQUENCY (HIGHER PART)																POS 32
D5	TUNING FREQUENCY (LOWER PART)																
D6	S-SYS			AFT		(auto)		C-SYS									
D7	TUNING FREQUENCY (HIGHER PART)																POS 33
D8	TUNING FREQUENCY (LOWER PART)																
D9	S-SYS			AFT		(auto)		C-SYS									
DA	TUNING FREQUENCY (HIGHER PART)																POS 34
DB	TUNING FREQUENCY (LOWER PART)																
DC	S-SYS			AFT		(auto)		C-SYS									
DD	TUNING FREQUENCY (HIGHER PART)																POS 35
DE	TUNING FREQUENCY (LOWER PART)																
DF	S-SYS			AFT		(auto)		C-SYS									
E0	TUNING FREQUENCY (HIGHER PART)																POS 36
E1	TUNING FREQUENCY (LOWER PART)																
E2	S-SYS			AFT		(auto)		C-SYS									
E3	TUNING FREQUENCY (HIGHER PART)																POS 37
E4	TUNING FREQUENCY (LOWER PART)																
E5	S-SYS			AFT		(auto)		C-SYS									
E6	TUNING FREQUENCY (HIGHER PART)																POS 38
E7	TUNING FREQUENCY (LOWER PART)																
E8	S-SYS			AFT		(auto)		C-SYS									
E9	TUNING FREQUENCY (HIGHER PART)																POS 39
EA	TUNING FREQUENCY (LOWER PART)																
EB	S-SYS			AFT		(auto)		C-SYS									
EC	TUNING FREQUENCY (HIGHER PART)																POS 40
ED	TUNING FREQUENCY (LOWER PART)																
EE	S-SYS			AFT		(auto)		C-SYS									
EF	TUNING FREQUENCY (HIGHER PART)																POS 41
F0	TUNING FREQUENCY (LOWER PART)																
F1	S-SYS			AFT		(auto)		C-SYS									
F2	TUNING FREQUENCY (HIGHER PART)																POS 42
F3	TUNING FREQUENCY (LOWER PART)																
F4	S-SYS			AFT		(auto)		C-SYS									
F5	TUNING FREQUENCY (HIGHER PART)																POS 43
F6	TUNING FREQUENCY (LOWER PART)																
F7	S-SYS			AFT		(auto)		C-SYS									
F8	TUNING FREQUENCY (HIGHER PART)																POS 44
F9	TUNING FREQUENCY (LOWER PART)																
FA	S-SYS			AFT		(auto)		C-SYS									
FB	TUNING FREQUENCY (HIGHER PART)																POS 45
FC	TUNING FREQUENCY (LOWER PART)																
FD	S-SYS			AFT		(auto)		C-SYS									
FE																	POS 46
FF																	
MODEL									MODEL								
LETTER NO.									LETTER NO.								

ADDRESS	DATA								MICON	EEPROM	EEPROM	CHASSIS		CTV FINAL		LAST INITIAL	REMARK
(HEX)	D7	D6	D5	D4	D3	D2	D1	D0	DEFAULT	RANGE	WRITE(CPU)	CHECK DATA	CHECK TYPE	CHECK DATA	CHECK TYPE	SETTING DATA	
100																	POS 46
101	TUNING FREQUENCY (HIGHER PART)																POS 47
102	TUNING FREQUENCY (LOWER PART)																
103	S-SYS			AFT	(auto)			C-SYS									
104	TUNING FREQUENCY (HIGHER PART)																POS 48
105	TUNING FREQUENCY (LOWER PART)																
106	S-SYS			AFT	(auto)			C-SYS									
107	TUNING FREQUENCY (HIGHER PART)																POS 49
108	TUNING FREQUENCY (LOWER PART)																
109	S-SYS			AFT	(auto)			C-SYS									
10A	TUNING FREQUENCY (HIGHER PART)																POS 50
10B	TUNING FREQUENCY (LOWER PART)																
10C	S-SYS			AFT	(auto)			C-SYS									
10D	TUNING FREQUENCY (HIGHER PART)																POS 51
10E	TUNING FREQUENCY (LOWER PART)																
10F	S-SYS			AFT	(auto)			C-SYS									
110	TUNING FREQUENCY (HIGHER PART)																POS 52
111	TUNING FREQUENCY (LOWER PART)																
112	S-SYS			AFT	(auto)			C-SYS									
113	TUNING FREQUENCY (HIGHER PART)																POS 53
114	TUNING FREQUENCY (LOWER PART)																
115	S-SYS			AFT	(auto)			C-SYS									
116	TUNING FREQUENCY (HIGHER PART)																POS 54
117	TUNING FREQUENCY (LOWER PART)																
118	S-SYS			AFT	(auto)			C-SYS									
119	TUNING FREQUENCY (HIGHER PART)																POS 55
11A	TUNING FREQUENCY (LOWER PART)																
11B	S-SYS			AFT	(auto)			C-SYS									
11C	TUNING FREQUENCY (HIGHER PART)																POS 56
11D	TUNING FREQUENCY (LOWER PART)																
11E	S-SYS			AFT	(auto)			C-SYS									
11F	TUNING FREQUENCY (HIGHER PART)																POS 57
120	TUNING FREQUENCY (LOWER PART)																
121	S-SYS			AFT	(auto)			C-SYS									
122	TUNING FREQUENCY (HIGHER PART)																POS 58
123	TUNING FREQUENCY (LOWER PART)																
124	S-SYS			AFT	(auto)			C-SYS									
125	TUNING FREQUENCY (HIGHER PART)																POS 59
126	TUNING FREQUENCY (LOWER PART)																
127	S-SYS			AFT	(auto)			C-SYS									
128	TUNING FREQUENCY (HIGHER PART)																POS 60
129	TUNING FREQUENCY (LOWER PART)																
12A	S-SYS			AFT	(auto)			C-SYS									
12B	TUNING FREQUENCY (HIGHER PART)																POS 61
12C	TUNING FREQUENCY (LOWER PART)																
12D	S-SYS			AFT	(auto)			C-SYS									
12E	TUNING FREQUENCY (HIGHER PART)																POS 62
12F	TUNING FREQUENCY (LOWER PART)																
130	S-SYS			AFT	(auto)			C-SYS									
131	TUNING FREQUENCY (HIGHER PART)																POS 63
132	TUNING FREQUENCY (LOWER PART)																
133	S-SYS			AFT	(auto)			C-SYS									
134	TUNING FREQUENCY (HIGHER PART)																POS 64
135	TUNING FREQUENCY (LOWER PART)																
136	S-SYS			AFT	(auto)			C-SYS									
137	TUNING FREQUENCY (HIGHER PART)																POS 65
138	TUNING FREQUENCY (LOWER PART)																
139	S-SYS			AFT	(auto)			C-SYS									
13A	TUNING FREQUENCY (HIGHER PART)																POS 66
13B	TUNING FREQUENCY (LOWER PART)																
13C	S-SYS			AFT	(auto)			C-SYS									
13D	TUNING FREQUENCY (HIGHER PART)																POS 67
13E	TUNING FREQUENCY (LOWER PART)																
13F	S-SYS			AFT	(auto)			C-SYS									
MODEL									MODEL								
LETTER NO.									LETTER NO.								

ADDRESS	DATA								MICON	EEPROM	EEPROM	CHASSIS		CTV FINAL		LAST INITIAL	REMARK
(HEX)	D7	D6	D5	D4	D3	D2	D1	D0	DEFAULT	RANGE	WRITE(CPU)	CHECK DATA	CHECK TYPE	CHECK DATA	CHECK TYPE	SETTING DATA	
140	TUNING FREQUENCY (HIGHER PART)																POS 68
141	TUNING FREQUENCY (LOWER PART)																
142	S-SYS			AFT	(auto)			C-SYS									
143	TUNING FREQUENCY (HIGHER PART)																POS 69
144	TUNING FREQUENCY (LOWER PART)																
145	S-SYS			AFT	(auto)			C-SYS									
146	TUNING FREQUENCY (HIGHER PART)																POS 70
147	TUNING FREQUENCY (LOWER PART)																
148	S-SYS			AFT	(auto)			C-SYS									
149	TUNING FREQUENCY (HIGHER PART)																POS 71
14A	TUNING FREQUENCY (LOWER PART)																
14B	S-SYS			AFT	(auto)			C-SYS									
14C	TUNING FREQUENCY (HIGHER PART)																POS 72
14D	TUNING FREQUENCY (LOWER PART)																
14E	S-SYS			AFT	(auto)			C-SYS									
14F	TUNING FREQUENCY (HIGHER PART)																POS 73
150	TUNING FREQUENCY (LOWER PART)																
151	S-SYS			AFT	(auto)			C-SYS									
152	TUNING FREQUENCY (HIGHER PART)																POS 74
153	TUNING FREQUENCY (LOWER PART)																
154	S-SYS			AFT	(auto)			C-SYS									
155	TUNING FREQUENCY (HIGHER PART)																POS 75
156	TUNING FREQUENCY (LOWER PART)																
157	S-SYS			AFT	(auto)			C-SYS									
158	TUNING FREQUENCY (HIGHER PART)																POS 76
159	TUNING FREQUENCY (LOWER PART)																
15A	S-SYS			AFT	(auto)			C-SYS									
15B	TUNING FREQUENCY (HIGHER PART)																POS 77
15C	TUNING FREQUENCY (LOWER PART)																
15D	S-SYS			AFT	(auto)			C-SYS									
15E	TUNING FREQUENCY (HIGHER PART)																POS 78
15F	TUNING FREQUENCY (LOWER PART)																
160	S-SYS			AFT	(auto)			C-SYS									
161	TUNING FREQUENCY (HIGHER PART)																POS 79
162	TUNING FREQUENCY (LOWER PART)																
163	S-SYS			AFT	(auto)			C-SYS									
164	TUNING FREQUENCY (HIGHER PART)																POS 80
165	TUNING FREQUENCY (LOWER PART)																
166	S-SYS			AFT	(auto)			C-SYS									
167	TUNING FREQUENCY (HIGHER PART)																POS 81
168	TUNING FREQUENCY (LOWER PART)																
169	S-SYS			AFT	(auto)			C-SYS									
16A	TUNING FREQUENCY (HIGHER PART)																POS 82
16B	TUNING FREQUENCY (LOWER PART)																
16C	S-SYS			AFT	(auto)			C-SYS									
16D	TUNING FREQUENCY (HIGHER PART)																POS 83
16E	TUNING FREQUENCY (LOWER PART)																
16F	S-SYS			AFT	(auto)			C-SYS									
170	TUNING FREQUENCY (HIGHER PART)																POS 84
171	TUNING FREQUENCY (LOWER PART)																
172	S-SYS			AFT	(auto)			C-SYS									
173	TUNING FREQUENCY (HIGHER PART)																POS 85
174	TUNING FREQUENCY (LOWER PART)																
175	S-SYS			AFT	(auto)			C-SYS									
176	TUNING FREQUENCY (HIGHER PART)																POS 86
177	TUNING FREQUENCY (LOWER PART)																
178	S-SYS			AFT	(auto)			C-SYS									
179	TUNING FREQUENCY (HIGHER PART)																POS 87
17A	TUNING FREQUENCY (LOWER PART)																
17B	S-SYS			AFT	(auto)			C-SYS									
17C	TUNING FREQUENCY (HIGHER PART)																POS 88
17D	TUNING FREQUENCY (LOWER PART)																
17E	S-SYS			AFT	(auto)			C-SYS									
17F																	POS 89
MODEL									MODEL								
LETTER NO.									LETTER NO.								

ADDRESS	DATA								MICON	EEPROM	EEPROM	CHASSIS		CTV FINAL		LAST INITIAL	
(HEX)	D7	D6	D5	D4	D3	D2	D1	D0	DEFAULT	RANGE	WRITE(CPU)	CHECK DATA	CHECK TYPE	CHECK DATA	CHECK TYPE	SETTING DATA	REMARK
180																	POS 89
181																	
182	TUNING FREQUENCY (HIGHER PART)																POS 90
183	TUNING FREQUENCY (LOWER PART)																
184	S-SYS			AFT	(auto)			C-SYS									
185	TUNING FREQUENCY (HIGHER PART)																POS 91
186	TUNING FREQUENCY (LOWER PART)																
187	S-SYS			AFT	(auto)			C-SYS									
188	TUNING FREQUENCY (HIGHER PART)																POS 92
189	TUNING FREQUENCY (LOWER PART)																
18A	S-SYS			AFT	(auto)			C-SYS									
18B	TUNING FREQUENCY (HIGHER PART)																POS 93
18C	TUNING FREQUENCY (LOWER PART)																
18D	S-SYS			AFT	(auto)			C-SYS									
18E	TUNING FREQUENCY (HIGHER PART)																POS 94
18F	TUNING FREQUENCY (LOWER PART)																
190	S-SYS			AFT	(auto)			C-SYS									
191	TUNING FREQUENCY (HIGHER PART)																POS 95
192	TUNING FREQUENCY (LOWER PART)																
193	S-SYS			AFT	(auto)			C-SYS									
194	TUNING FREQUENCY (HIGHER PART)																POS 96
195	TUNING FREQUENCY (LOWER PART)																
196	S-SYS			AFT	(auto)			C-SYS									
197	TUNING FREQUENCY (HIGHER PART)																POS 97
198	TUNING FREQUENCY (LOWER PART)																
199	S-SYS			AFT	(auto)			C-SYS									
19A	TUNING FREQUENCY (HIGHER PART)																POS 98
19B	TUNING FREQUENCY (LOWER PART)																
19C	S-SYS			AFT	(auto)			C-SYS									
19D	TUNING FREQUENCY (HIGHER PART)																POS 99
19E	TUNING FREQUENCY (LOWER PART)																
19F	S-SYS			AFT	(auto)			C-SYS									
1A0																	AV1
1A1																	
1A2					(auto)			C-SYS									
1A3																	AV2
1A4																	
1A5					(auto)			C-SYS									
1A6																	
1A7																	
1A8																	
1A9																	
1AA																	
1AB																	
1AC																	
1AD																	
1AE																	
1AF																	
1B0																	
1B1																	
1B2																	
1B3																	
1B4																	
1B5																	
1B6																	
1B7																	
1B8																	
1B9																	
1BA																	
1BB																	
1BC																	
1BD																	
1BE																	
1BF																	
MODEL									MODEL								
LETTER NO.									LETTER NO.								

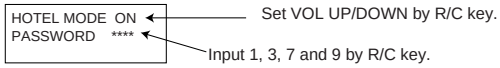
UA1 HOTEL MODE APPLICATION NOTE

The purpose of this HOTEL MODE is to enable hotel authorized person to store the tuned programs as hotel channels, current volume as hotel volume (maximum volume), picture and sound setting. In addition, The user will not be able to select Preset and Channel-setting functions.

How to enable/disable the “Hotel Mode” ?

Ans: a) Select BLUE BACK function (under MENU-FEATURE selection) by R/C, press the -/— (one/two digit) key and keep pressing it for five second, then you can see the hotel mode with four digits password.

b) Key in the four digits password starting with number “1”, “3”, “7”, “9”, then the hotel mode will be ENABLE condition, you can switch on/off the hotel mode by using R/C (volume up/down) key.



#1 Ch 1 is your selected channel for hotel mode.

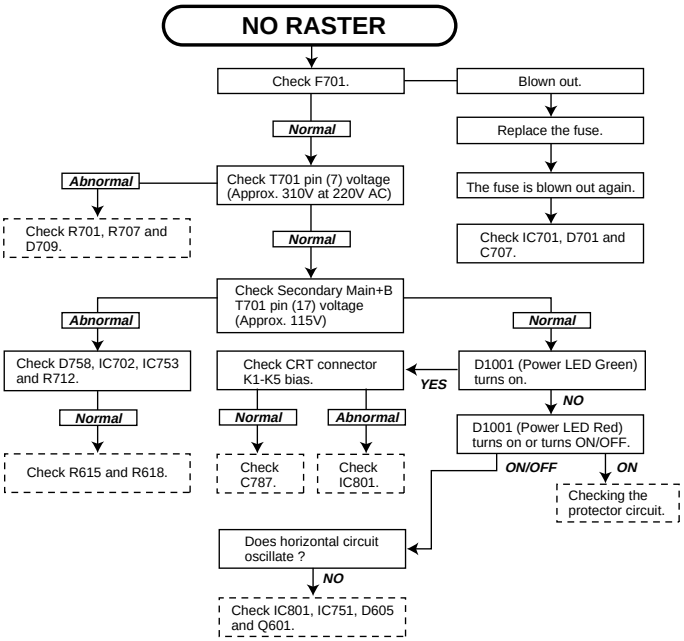
* We recommend:
Before set the hotel mode, it is better to choose CH 1 & set SOUND VOLUME level Up to 75% full scale.
After set hotel mode, starting channel will be always ch 1 & maximum sound level out will be set to 75% of full scale.

* If you set hotel mode in AV, starting channel will be the last ch which you received before power off (same as normal operation).

CONDITION:

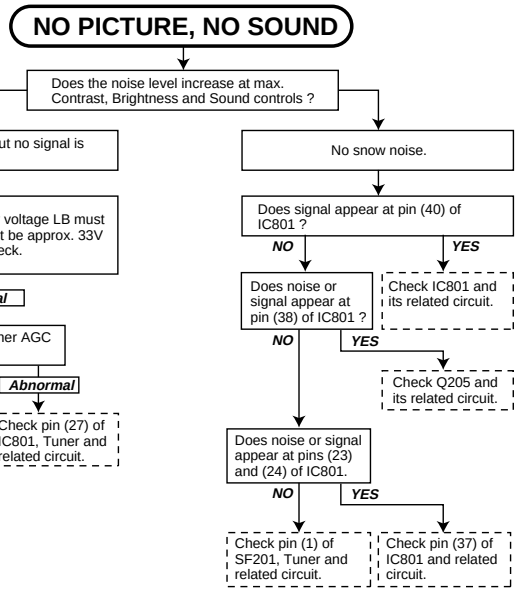
When using hotel mode, the user can ONLY control PICTURE, SOUND and FEATURE selection. But, It will return to the previous hotel mode setting condition, after power off. The user can’t use: — CH-SETTING (OSD become violet) and Preset. Other functions is allowed to be used.

TROUBLE SHOOTING TABLE

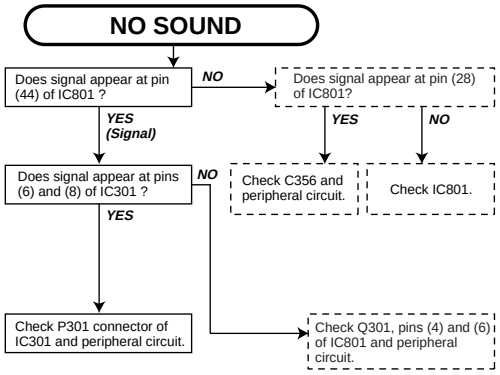


TROUBLE SHOOTING TABLE (Continued)

CIRCUITS TO BE CHECKED:
- Tuner.
- PIF.
- Automatic Gain Control.
- (5V), (33V) Power Source.

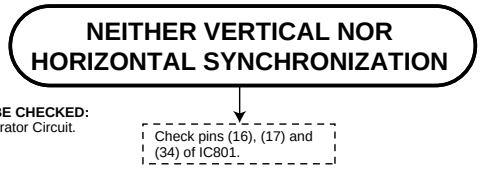

NO PICTURE, NO SOUND
Does the noise level increase at max. Contrast, Brightness and Sound controls ?
Noise increases but no signal is received.
No snow noise.
Check the tuner supply voltage LB must be approx. 5V. BT must be approx. 33V and CH preset data check.
Does signal appear at pin (40) of IC801 ?
NO
YES
Does noise or signal appear at pin (38) of IC801 ?
Check IC801 and its related circuit.
Normal
Check the tuner AGC at TP201.
NO
YES
Check Q205 and its related circuit.
Normal
Abnormal
Check pin (38) of IC801.
Check pin (27) of IC801, Tuner and related circuit.
Does noise or signal appear at pins (23) and (24) of IC801.
NO
YES
Check pin (1) of SF201, Tuner and related circuit.
Check pin (37) of IC801 and related circuit.

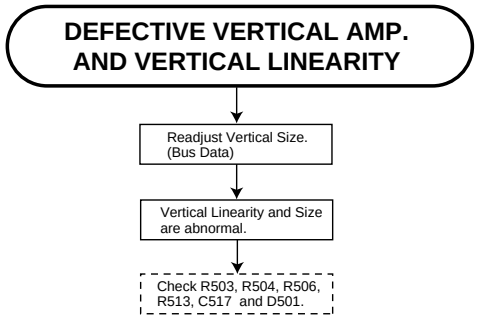
CIRCUITS TO BE CHECKED:
- Sound system pins (28) and (44) of IC801.
- Sound Detector Circuit.
- Sound Switch and Att. Control.
- Audio Output Circuit.

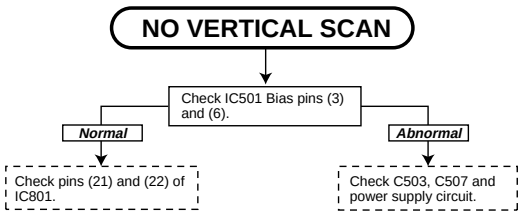

NO SOUND
Does signal appear at pin (44) of IC801 ?
NO
Does signal appear at pin (28) of IC801?
YES (Signal)
YES
NO
Does signal appear at pins (6) and (8) of IC301 ?
NO
Check C356 and peripheral circuit.
Check IC801.
YES
Check P301 connector of IC301 and peripheral circuit.
Check Q301, pins (4) and (6) of IC801 and peripheral circuit.

TROUBLE SHOOTING TABLE (Continued)

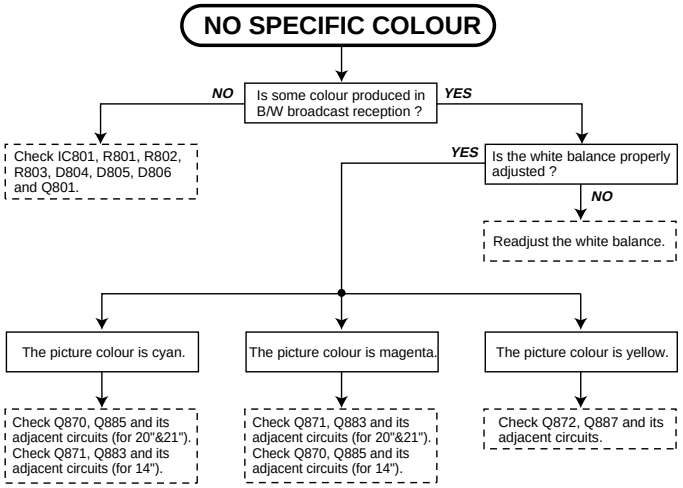
CIRCUIT TO BE CHECKED:
- Sync. Separator Circuit.

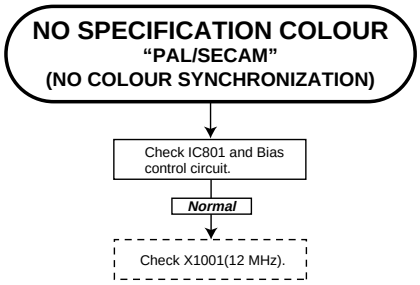



DEFECTIVE VERTICAL AMP. AND VERTICAL LINEARITY
Readjust Vertical Size. (Bus Data)
Vertical Linearity and Size are abnormal.
Check R503, R504, R506, R513, C517 and D501.


NO VERTICAL SCAN
Check IC501 Bias pins (3) and (6).
Normal
Abnormal
Check pins (21) and (22) of IC801.
Check C503, C507 and power supply circuit.

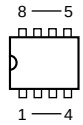
TROUBLE SHOOTING TABLE (Continued)


NO SPECIFIC COLOUR
Is some colour produced in B/W broadcast reception ?
NO
YES
Check IC801, R801, R802, R803, D804, D805, D806 and Q801.
YES
Is the white balance properly adjusted ?
NO
Readjust the white balance.
The picture colour is cyan.
The picture colour is magenta.
The picture colour is yellow.
Check Q870, Q885 and its adjacent circuits (for 20"&21"). Check Q871, Q883 and its adjacent circuits (for 14").
Check Q871, Q883 and its adjacent circuits (for 20"&21"). Check Q870, Q885 and its adjacent circuits (for 14").
Check Q872, Q887 and its adjacent circuits.

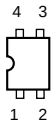


SOLID STATE DEVICE BASE DIAGRAM

TOP VIEW

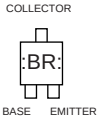


M24C04W

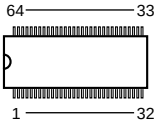


FX0008GE

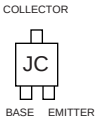
D601A



B709A

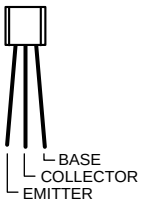


IX3368CE

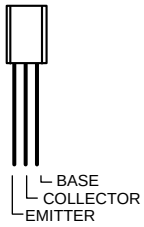


2SC2735

SIDE VIEW

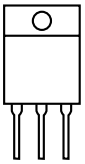


2SC1815

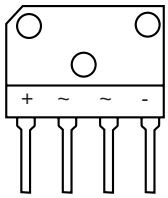


2SC2482

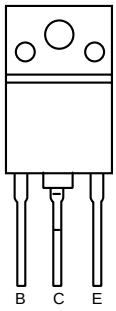
PST573J



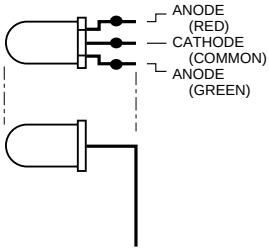
SE115N



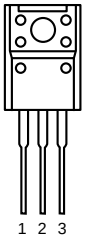
DX0386CE



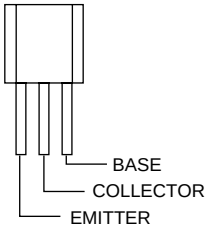
2SD1877(14")
2SD2586(20" & 21")



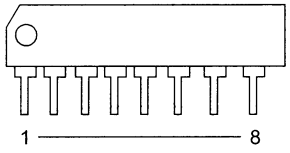
PX0423CE



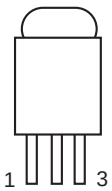
KA7808
KA7805



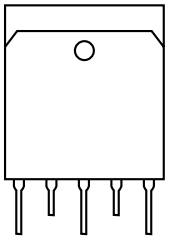
BF421
BF422



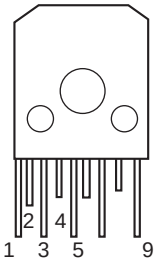
LA7016



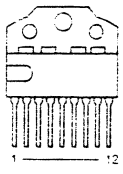
TA48M033



STRF6653(14")
STRF6654(20" & 21")

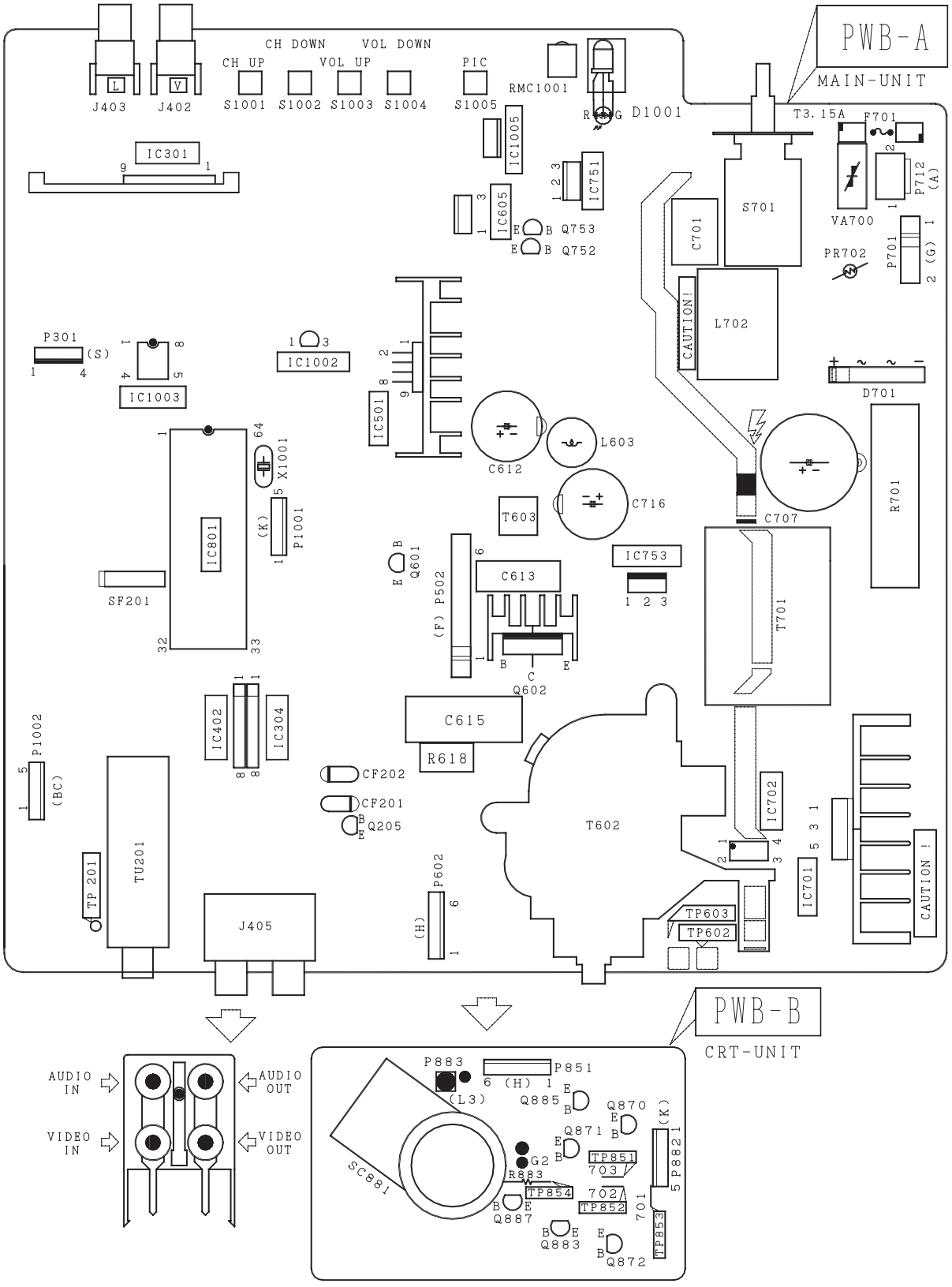


TDA8357

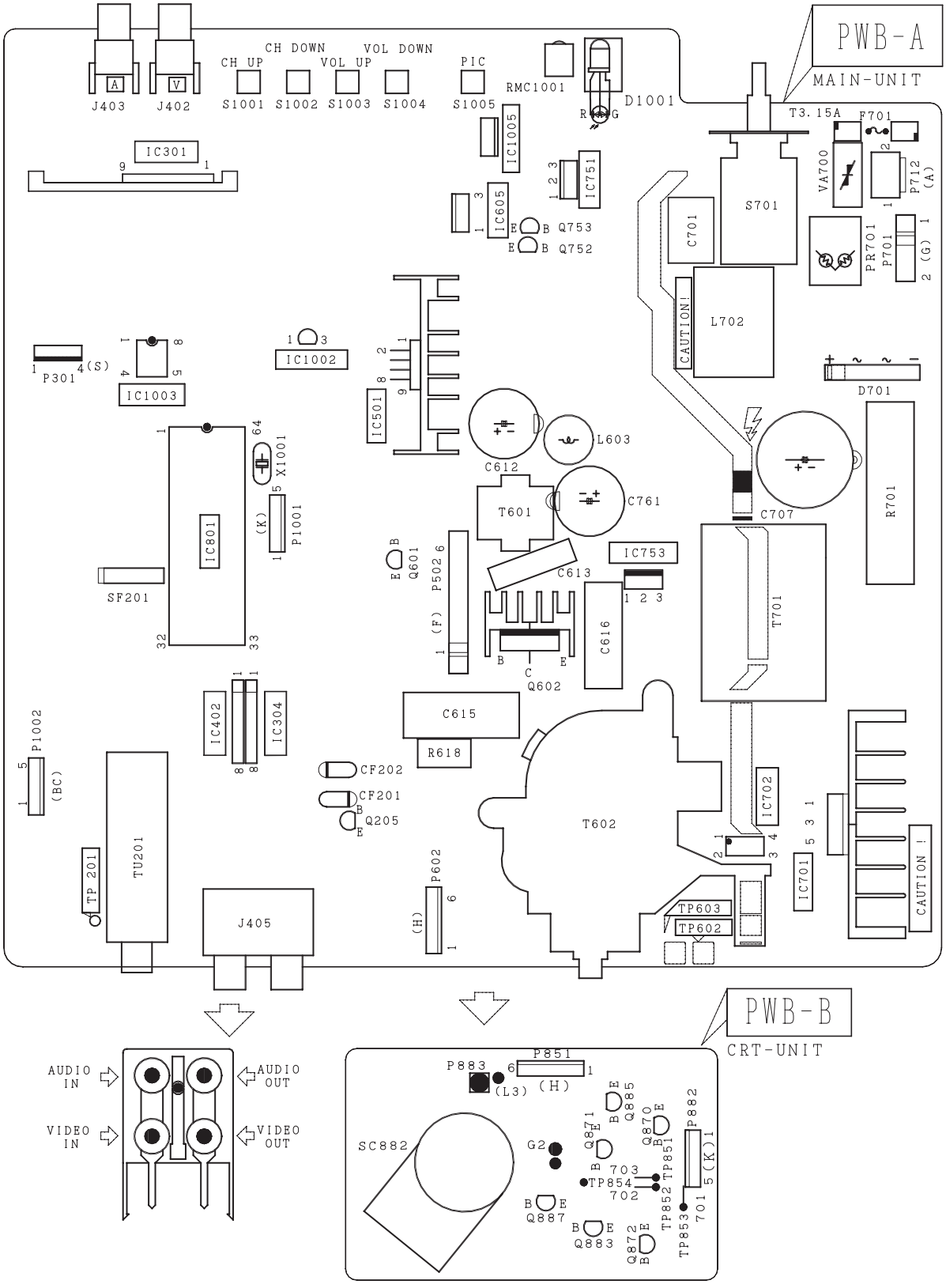


TDA7056A

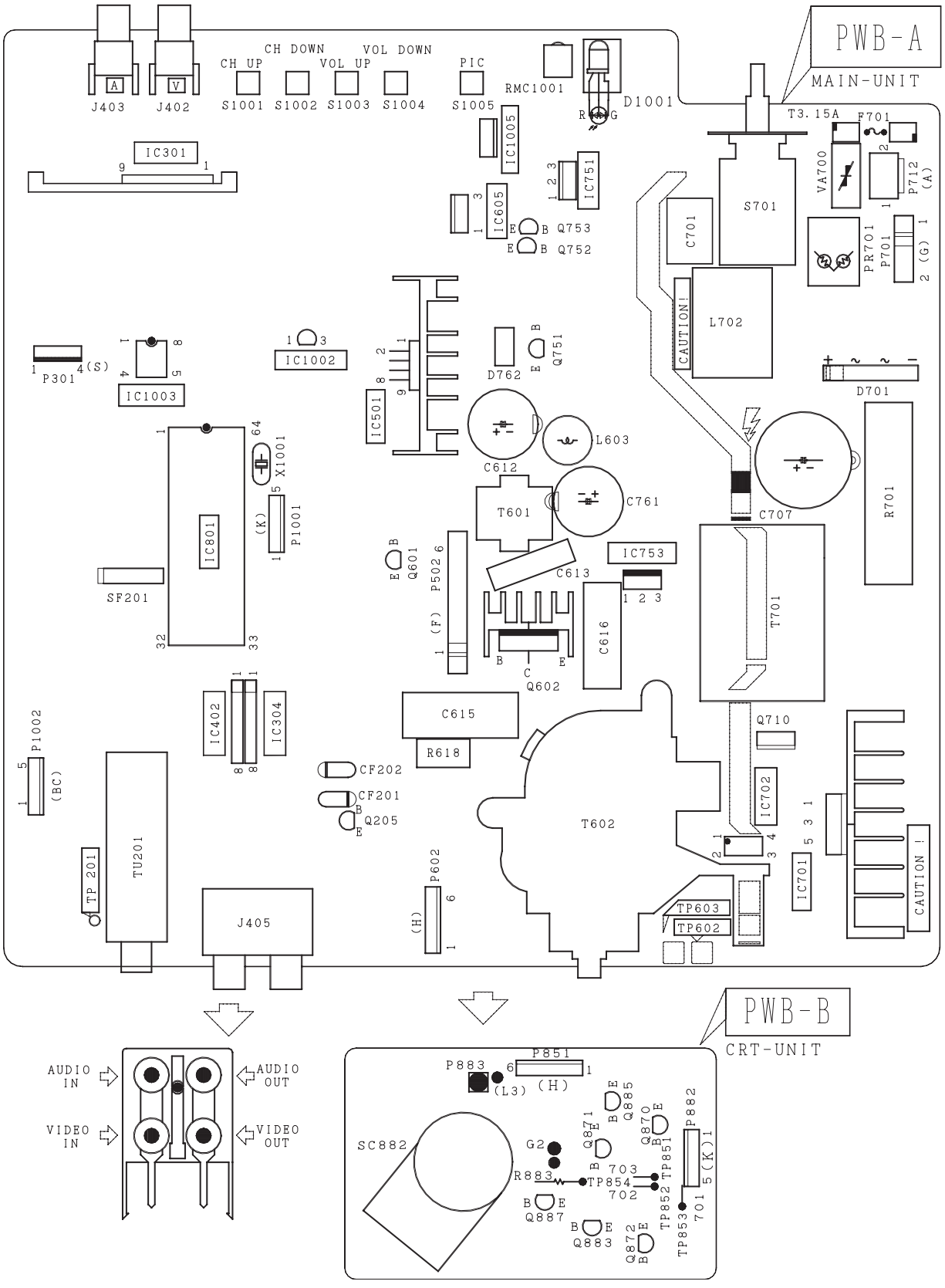
CHASSIS LAYOUT : 14BM2S/G



CHASSIS LAYOUT : 20BM2S/G

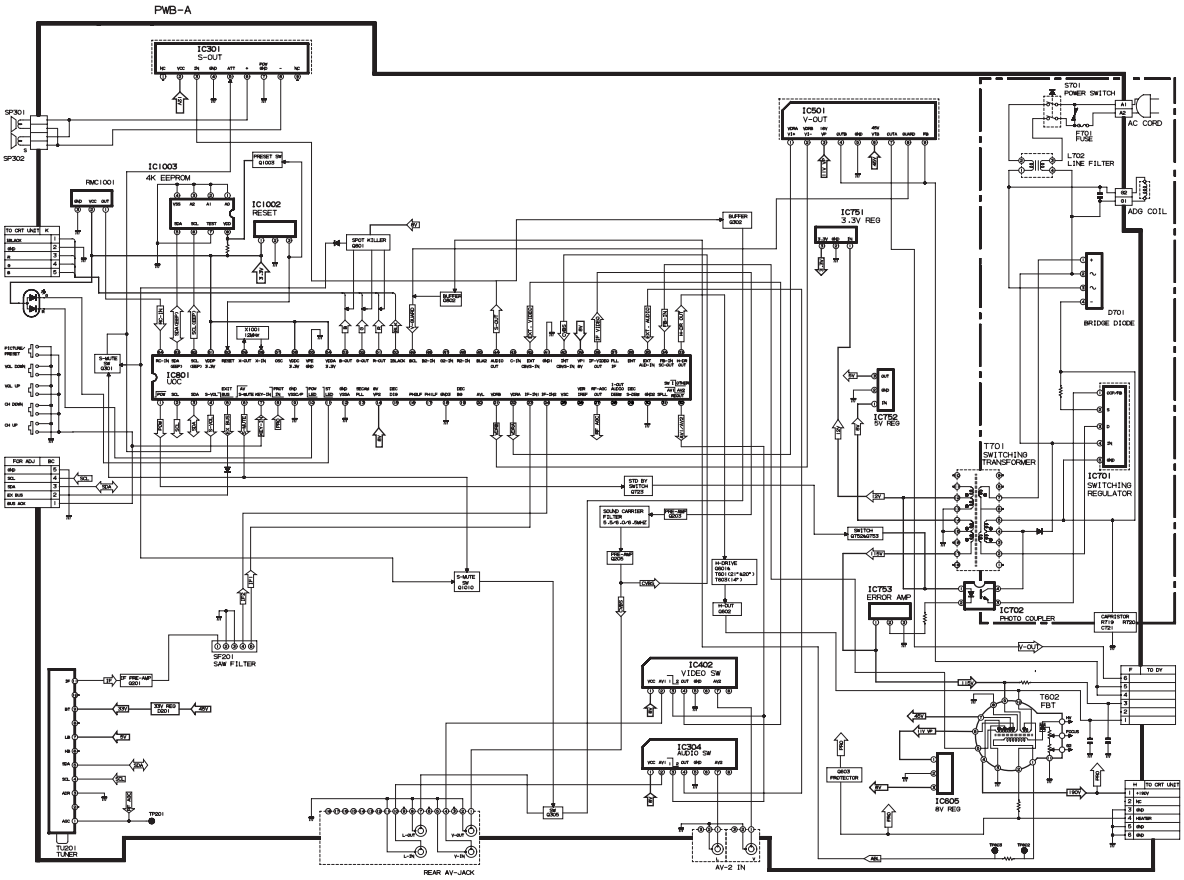


CHASSIS LAYOUT : 21BM2S/G



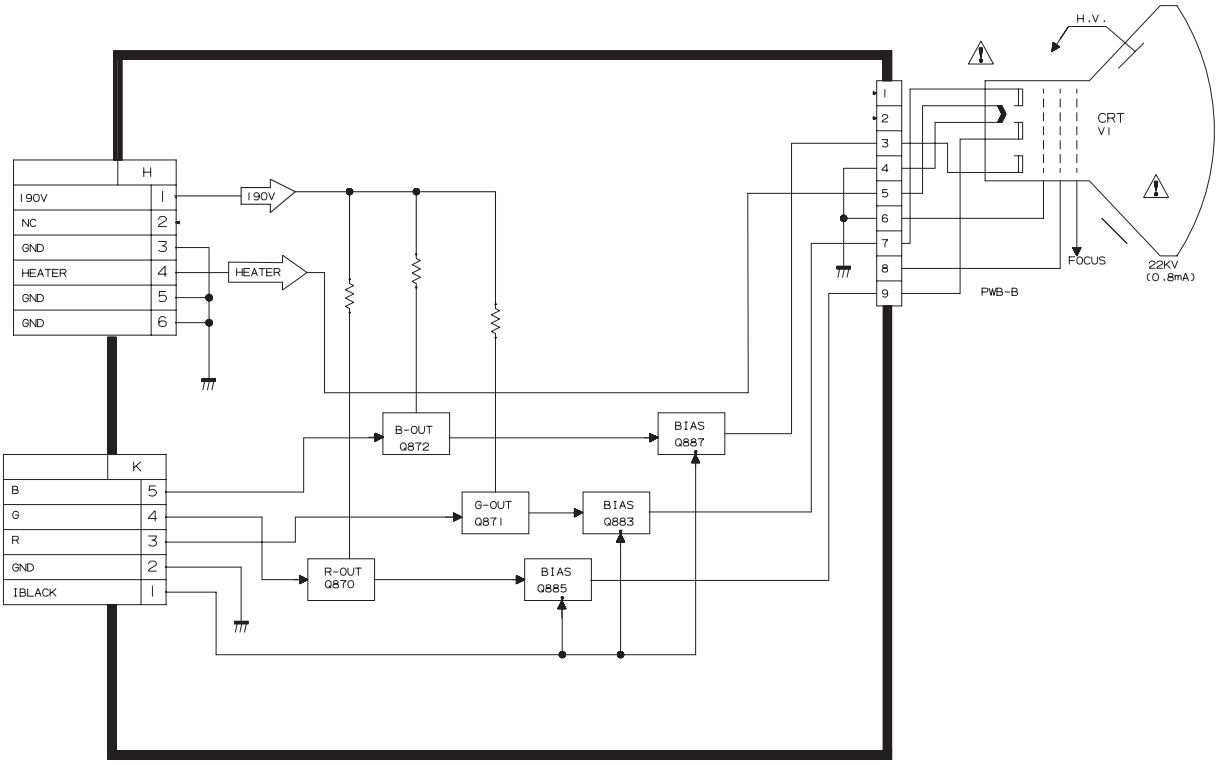
14BM2, 14BM2S/G
20BM2, 20BM2S/G
21BM2, 21BM2S/G

MAIN UNIT BLOCK DIAGRAM

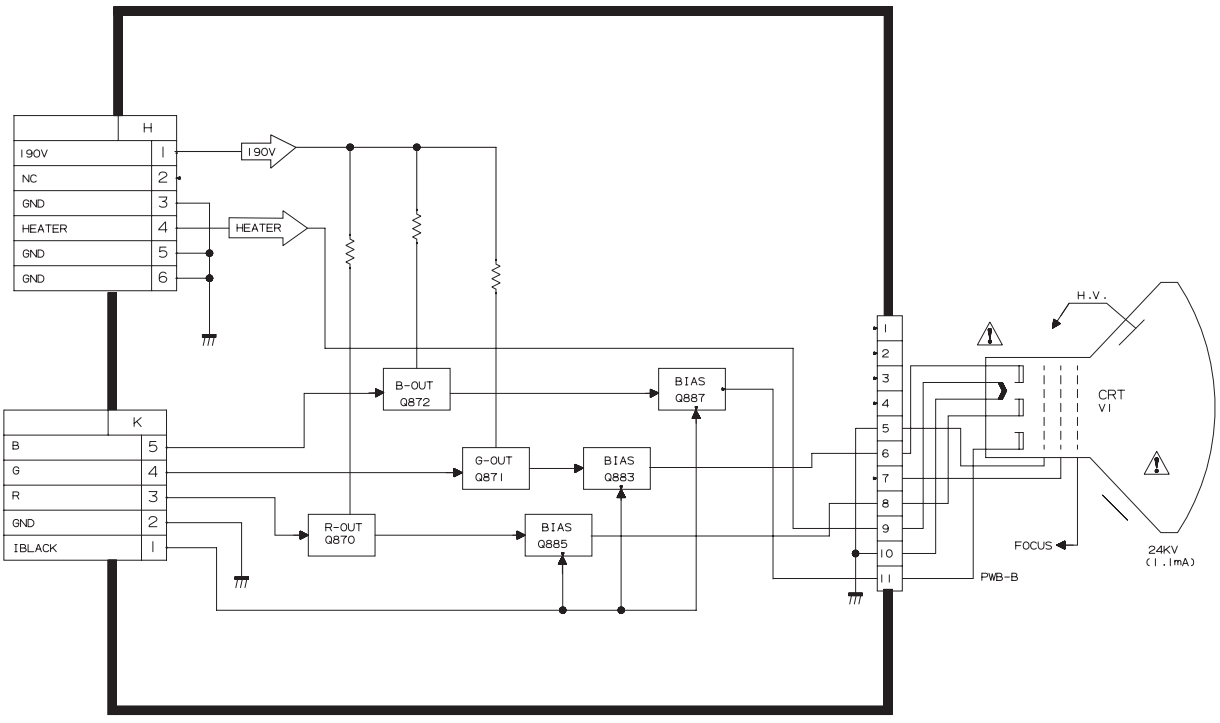


BLOCK DIAGRAM

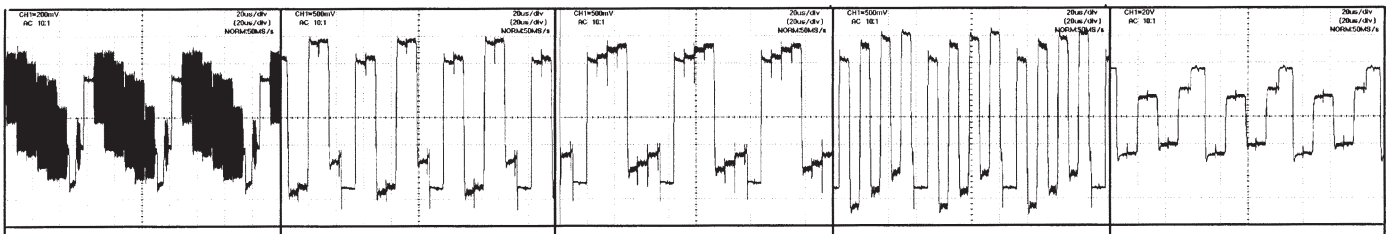
CRT UNIT BLOCK DIAGRAM : 14BM2S/G



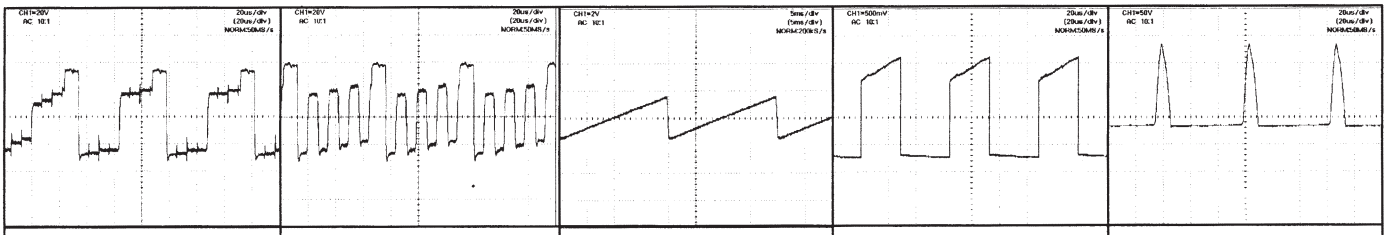
CRT UNIT BLOCK DIAGRAM : 20BM2S/G/21BM2S/G



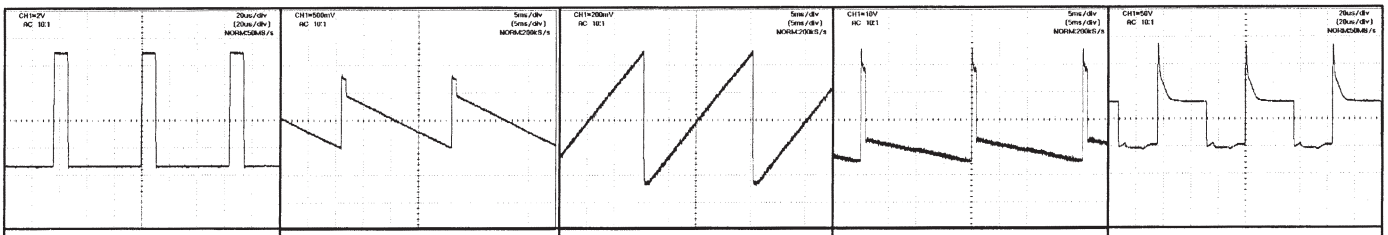
WAVEFORMS



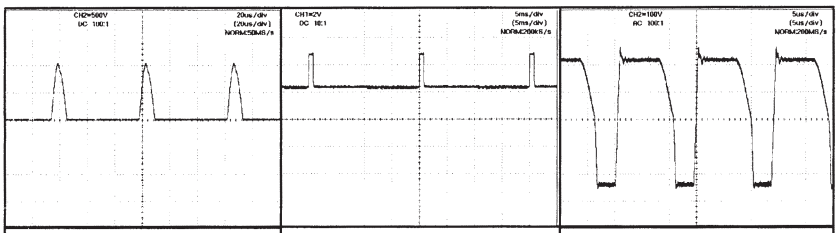
① 1.00Vp-p 14" 1.12Vp-p 21" & 20"	② 2.50Vp-p 14" 3.17Vp-p 21" & 20"	③ 2.55Vp-p 14" 3.11Vp-p 21" & 20"	④ 3.35Vp-p 14" 3.11Vp-p 21" & 20"	⑤ 68.0Vp-p 14" 83.8Vp-p 21" & 20"



⑥ 66.0Vp-p 14" 80.0Vp-p 21" & 20"	⑦ 72.0Vp-p 14" 87.2Vp-p 21" & 20"	⑧ 3.00Vp-p 14" 3.11Vp-p 21" & 20"	⑨ 1.85Vp-p 14" 1.93Vp-p 21" & 20"	⑩ 150Vp-p 14" 133Vp-p 21" & 20"



⑪ 8.40Vp-p 14" 8.48Vp-p 21" & 20"	⑫ 1.30Vp-p 14" 1.17Vp-p 21" & 20"	⑬ 0.98Vp-p 14" 0.91Vp-p 21" & 20"	⑭ 43.0Vp-p 14" 48.0Vp-p 21" & 20"	⑮ 190.0Vp-p 14" 130.5Vp-p 21" & 20"



⑯ 1,050Vp-p 14" 980Vp-p 21" & 20"	⑰ 2.40Vp-p 14" 2.60Vp-p 21" & 20"	⑱ 500Vp-p 14" 510Vp-p 21" & 20"

DESCRIPTION OF SCHEMATIC DIAGRAM

SAFETY NOTES:

1. *DISCONNECT THE AC PLUG FROM THE AC OUTLET BEFORE REPLACING PARTS.*
2. *SEMICONDUCTOR HEAT SINKS SHOULD BE REGARDED AS POTENTIAL SHOCK HAZARDS WHEN THE CHASSIS IS OPERATING.*

IMPORTANT SAFETY NOTICE:

PARTS MARKED WITH "⚠" ( ) ARE IMPORTANT FOR MAINTAINING THE SAFETY OF THE SET. BE SURE TO REPLACE THESE PARTS WITH SPECIFIED ONES FOR MAINTAINING THE SAFETY AND PERFORMANCE OF THE SET.

SERVICE PRECAUTION:

THE AREA ENCLOSED BY THIS LINE (▬ ▬ ▬) IS DIRECTLY CONNECTED WITH AC MAINS VOLTAGE.
WHEN SERVICING THE AREA, CONNECT AN ISOLATING TRANSFORMER BETWEEN TV RECEIVER AND AC LINE TO ELIMINATE HAZARD OF ELECTRIC SHOCK.

NOTES:

1. *The unit of resistance "ohm" is omitted. (K = 1000 ohms, M = Meg ohm).*
2. *All resistors are 1/16 watt, unless otherwise noted.*
3. *Unit of all capacitors are F with prefix symbol (μ, P, ETC) .*

VOLTAGE MEASUREMENT CONDITIONS:

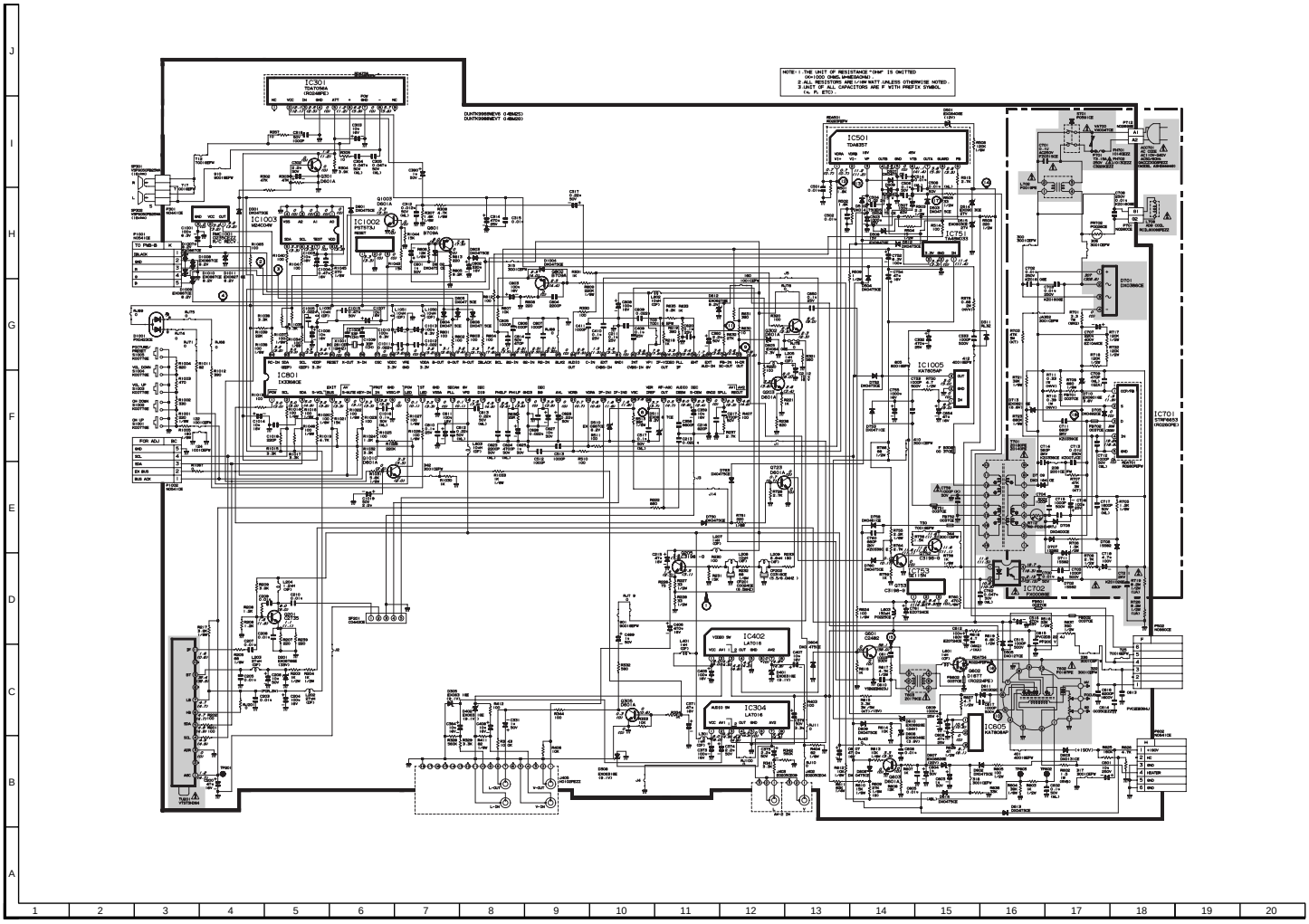
1. *Voltage in parenthesis measured with no Signal.*
2. *Voltages without parenthesis measured with PAL Colour-Signal.*
3. *All the voltages in each point are measured with high impedence volt-meter.*

WAVEFORM MEASUREMENT CONDITIONS:

1. *Colour bar generator signal of 1.8V peak to peak applied at Base of Video Buffer Amp. Q203.*
2. *Approximately 4.0 V AGC bias.*

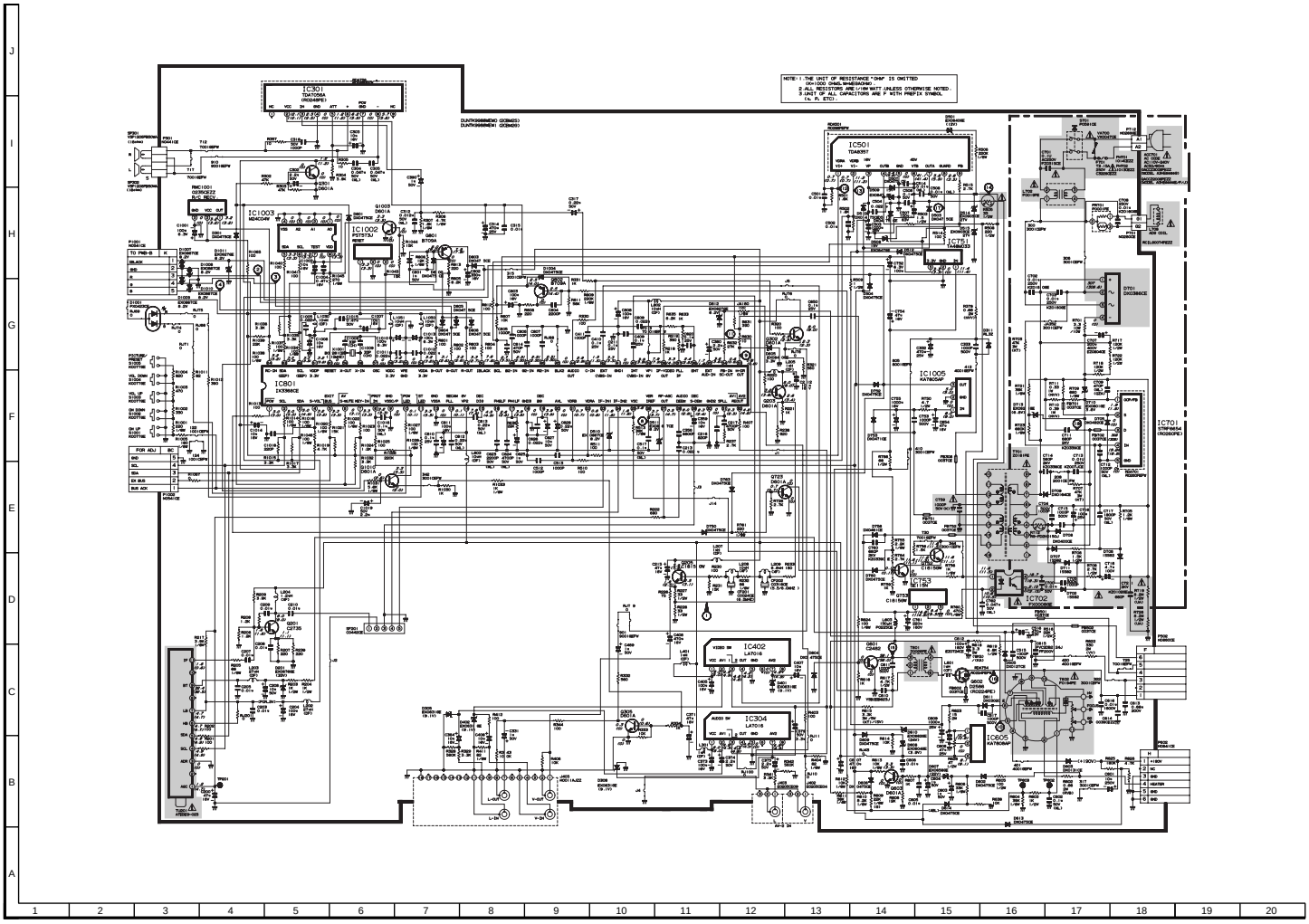
14BM2, 14BM2S/G
20BM2, 20BM2S/G
21BM2, 21BM2S/G

MAIN UNIT : 14BM2S/G



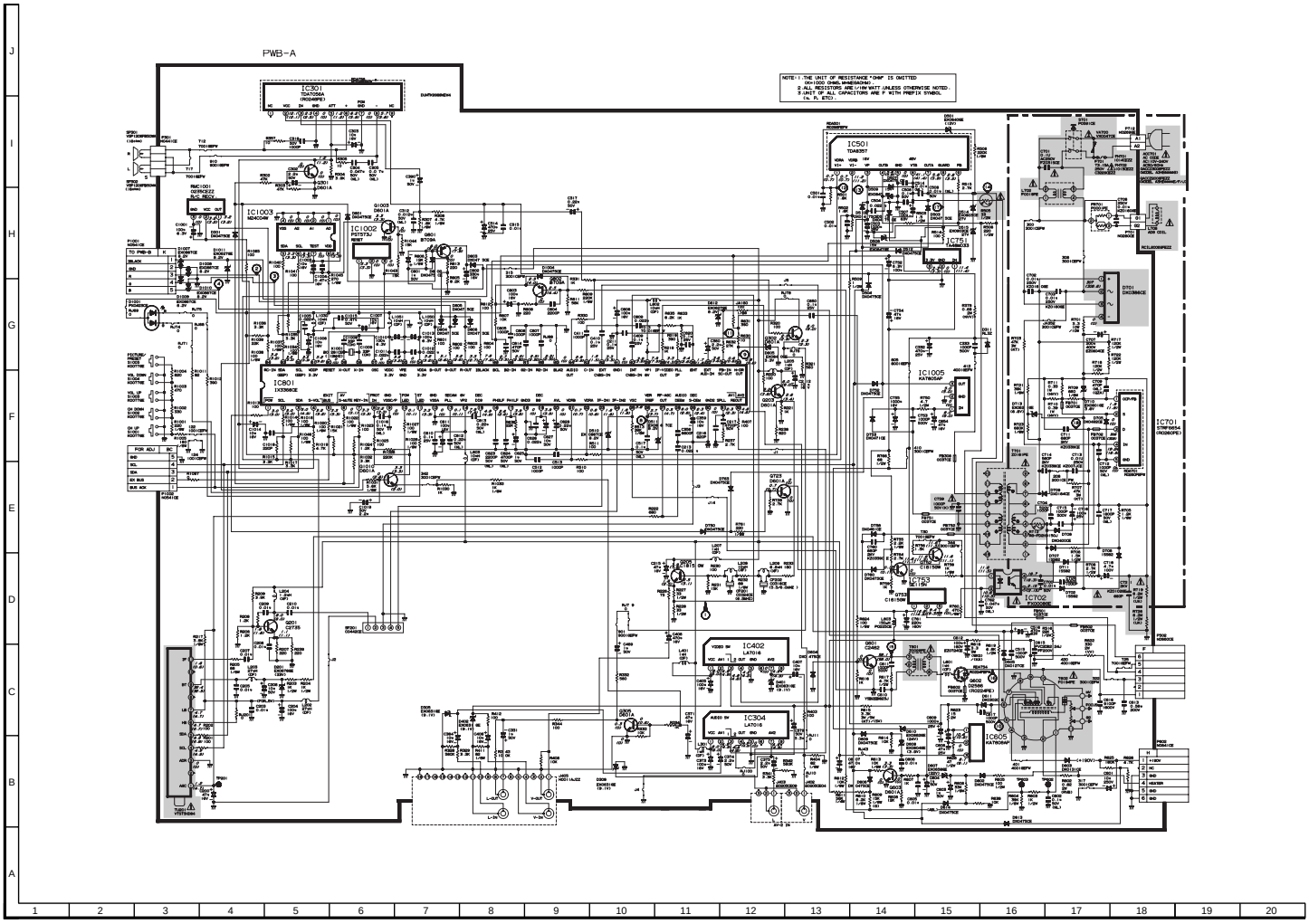
14BM2, 14BM2S/G
20BM2, 20BM2S/G
21BM2, 21BM2S/G

MAIN UNIT : 20BM2S/G

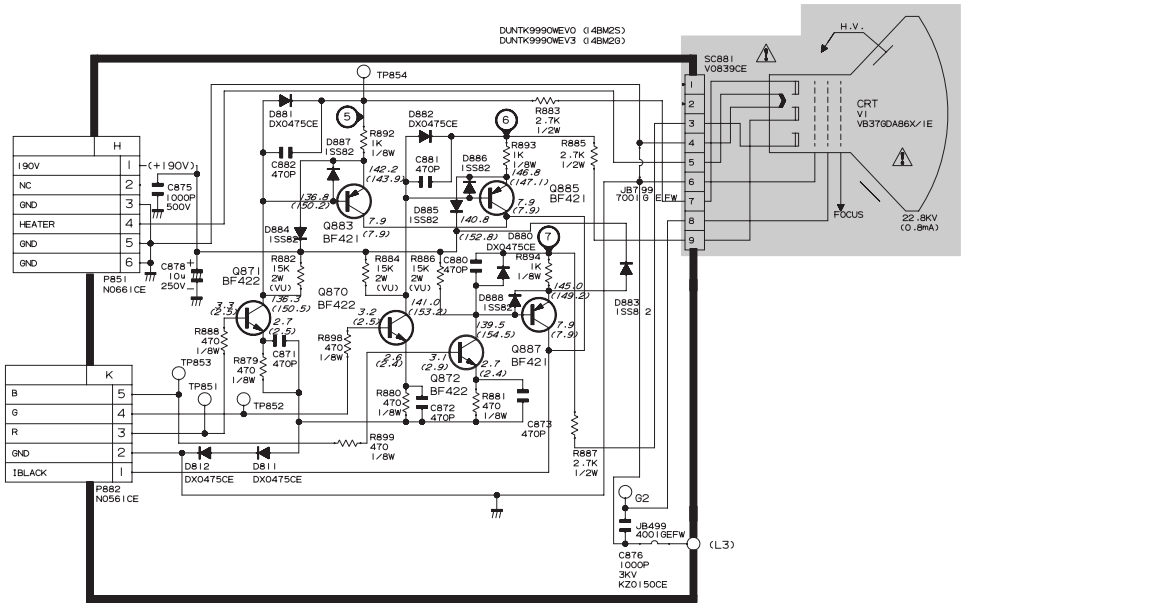


14BM2, 14BM2S/G
20BM2, 20BM2S/G
21BM2, 21BM2S/G

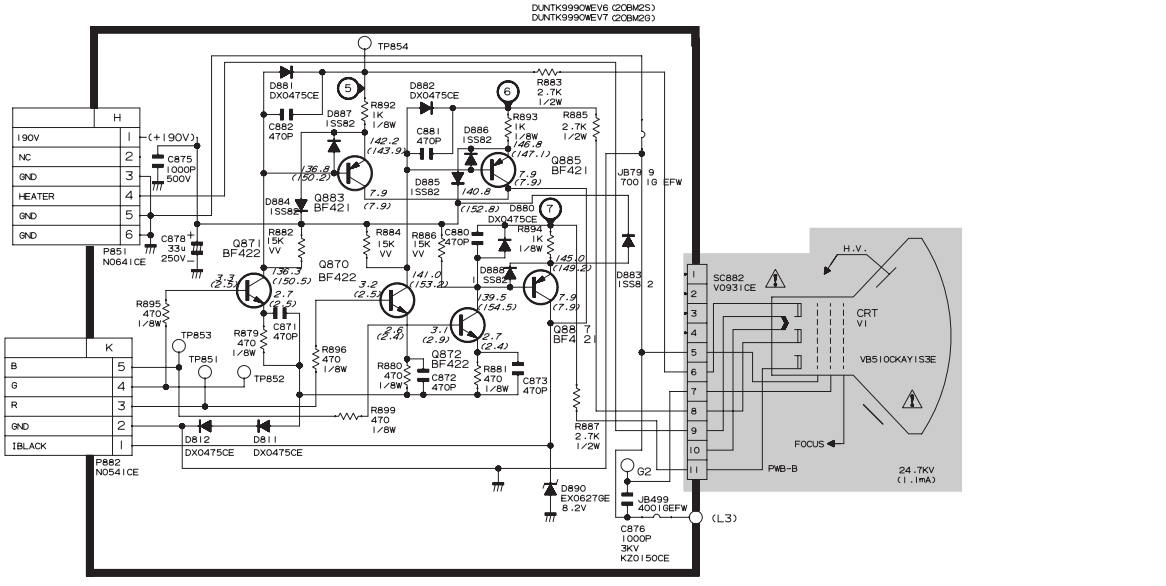
MAIN UNIT : 21BM2S/G



CRT UNIT : 14BM2S/G

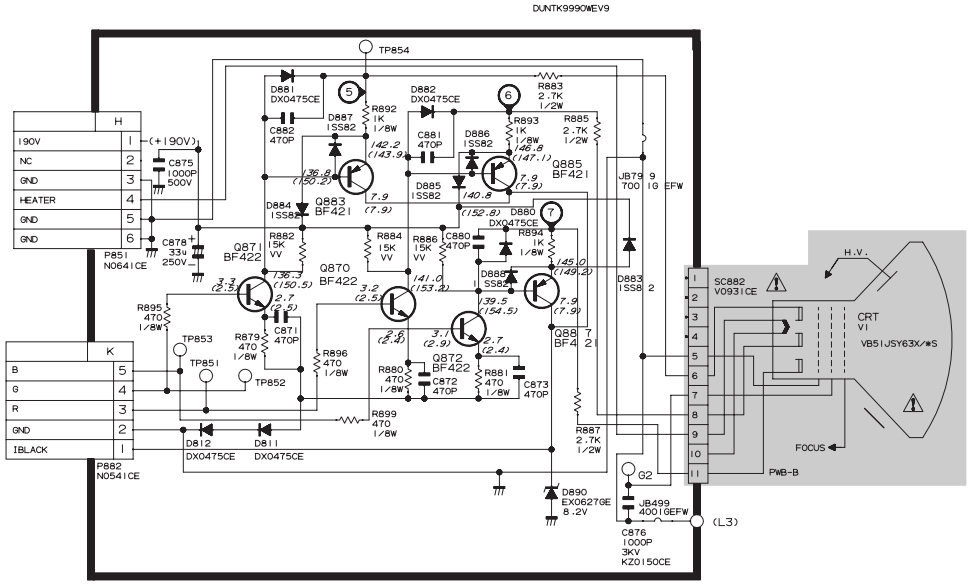


CRT UNIT : 20BM2S/G



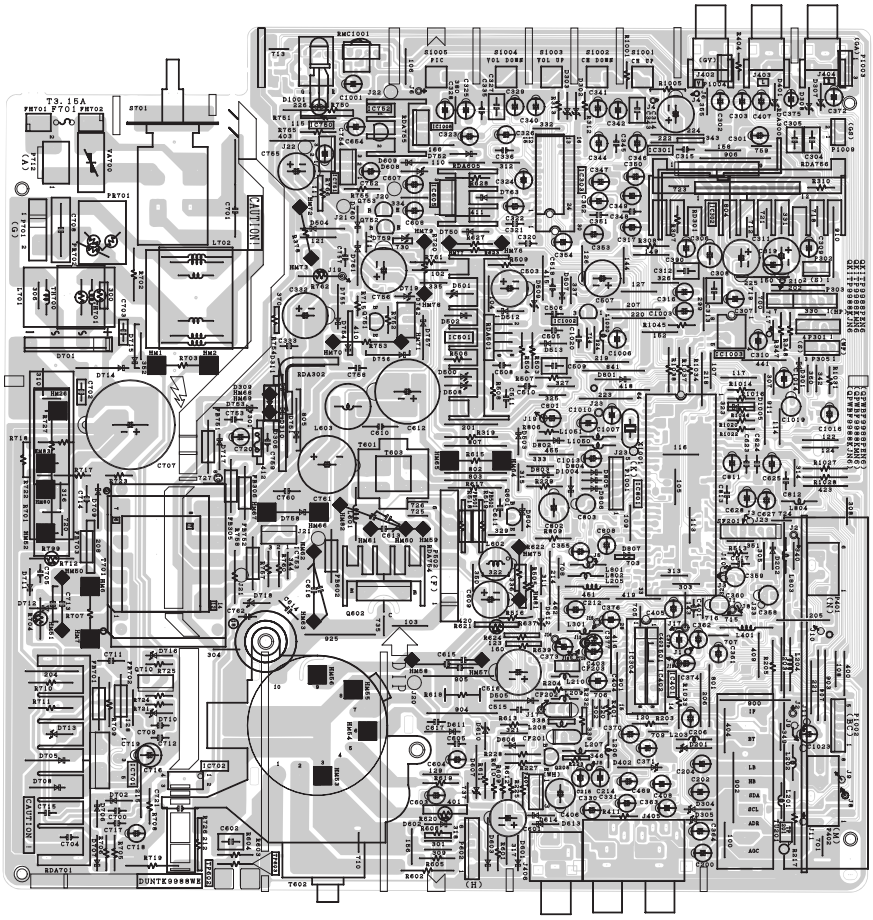
CRT UNIT : 21BM2S/G

NOTE: 1.THE UNIT OF RESISTANCE "OHM" IS OMITTED
(K=1000 OHMS, M=MEGAOHM).
2.ALL RESISTORS ARE 1/16W WATT.UNLESS OTHERWISE NOTED.
3.UNIT OF ALL CAPACITORS ARE F WITH PREFIX SYMBOL
(u, P, ETC).



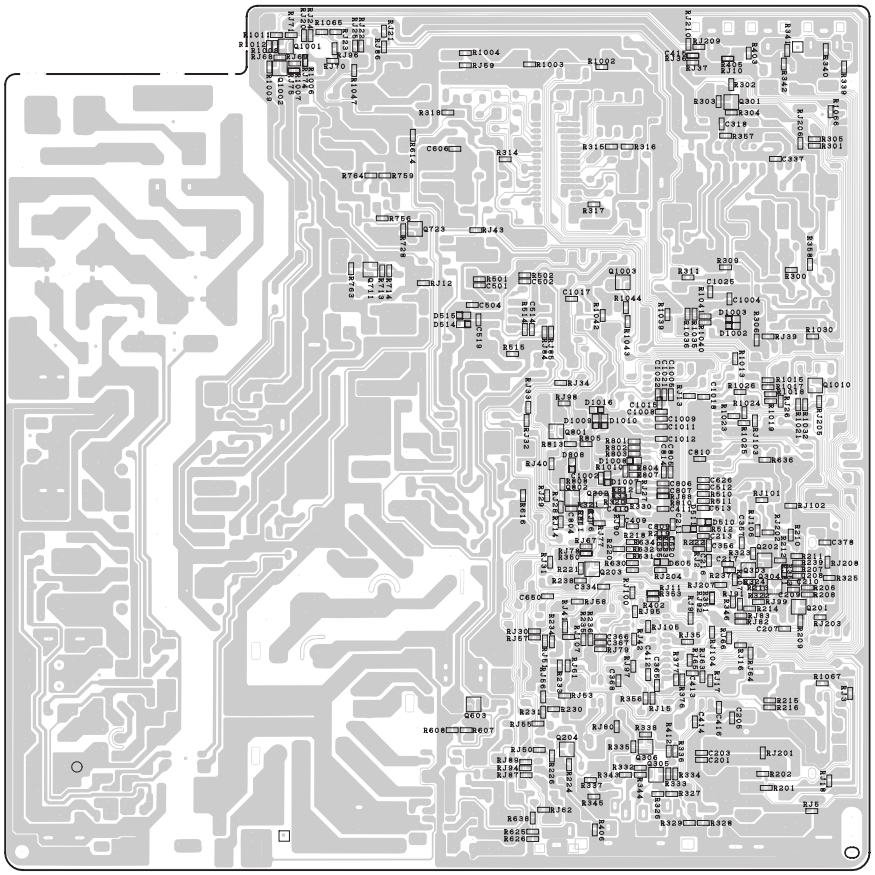
14BM2, 14BM2S/G
20BM2, 20BM2S/G
21BM2, 21BM2S/G

PRINTED WIRING BOARD ASSEMBLIES

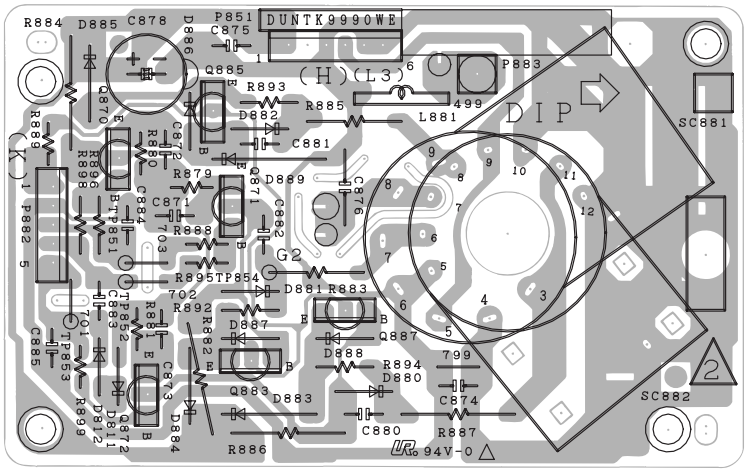


PWB-A: MAIN Unit (Wiring Side)

14BM2, 14BM2S/G
20BM2, 20BM2S/G
21BM2, 21BM2S/G



PWB-A: MAIN Unit (Chip Parts Side)



PWB-B: CRT Unit (Wiring Side)

REPLACEMENT PARTS LIST

PARTS REPLACEMENT

Replacement parts which have these special safety characteristics identified in this manual: electrical components having such features are identified by "⚠" in the Replacement Parts Lists.
The use of a substitute replacement part which does not have the same safety characteristics as the factory recommended replacement parts shown in this service manual may create shock, fire or other hazards.

"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.

1. MODEL NUMBER 2. REF. NO.
3. PART NO. 4. DESCRIPTION

MARK ★: SPARE PARTS-DELIVERY SECTION

Ref. No.	Part No.	★	Description	Code
PICTURE TUBE				
⚠	VB37GDA86X/1E	R	Picture Tube (14BM2S/G)	CB
⚠	VB510CKAY1S3E	R	Picture Tube (20BM2S/G)	CA
⚠	VB51JSY63X/*S	R	Picture Tube (21BM2S/G)	CE
⚠ L708	RCiLG0068PEZZ	R	Degaussing Coil (14BM2G)	AH
⚠ L708	RCiLG0095PEZZ	R	Degaussing Coil (14BM2S/G(Y))	AH
⚠ L708	RCiLG0074PEZZ	R	Degaussing Coil (20BM2S/G)	AQ
⚠ L708	RCiLG0069PEZZ	R	Degaussing Coil (21BM2S/G)	AR
	RCiLH0149PEZZ	R	Deflection Yoke (14BM2S/G)	BA
	RCiLH0146PEZZ	R	Deflection Yoke (21BM2S/G)	BF
	PMAGF3045CEZZ	R	Magnet(14BM2S/G)	AG
	PMAGF3046CEZZ	R	Magnet(21BM2S/G)	AF
	QEARC1422PEZZ	R	Grounding Strap (14BM2S/G)	AD
	QEARC2017PEZZ	R	Grounding Strap (20BM2S/G)	AE
	QEARC2107PEZZ	R	Grounding Strap (21BM2S/G)	AE

PRINTED WIRING BOARD ASSEMBLIES *(NOT REPLACEMENT ITEM)*

PWB-A	DUNTK9988WEV6	-	Main Unit(14BM2S/G(Y))	—
PWB-A	DUNTK9988WEV7	-	Main Unit(14BM2G)	—
PWB-A	DUNTK9988WEW0	-	Main Unit(20BM2S)	—
PWB-A	DUNTK9988WEW1	-	Main Unit(20BM2G)	—
PWB-A	DUNTK9988WEW4	-	Main Unit(21BM2S/G)	—
PWB-B	DUNTK9990WEV0	-	CRT Unit(14BM2S/G(Y))	—
PWB-B	DUNTK9990WEV3	-	CRT Unit(14BM2G)	—
PWB-B	DUNTK9990WEV6	-	CRT Unit(20BM2S)	—
PWB-B	DUNTK9990WEV7	-	CRT Unit(20BM2G)	—
PWB-B	DUNTK9990WEV9	-	CRT Unit(21BM2S/G)	—

Ref. No.	Part No.	★	Description	Code
DUNTK9988WEV6(14BM2S/G(Y))				
DUNTK9988WEV7(14BM2G)				
DUNTK9988WEW0(20BM2S)				
DUNTK9988WEW1(20BM2G)				
DUNTK9988WEW4(21BM2S/G)				
PWB-A : MAIN UNIT				
TUNER				
NOTE: THE PARTS HERE SHOWN ARE SUPPLIED AS AN ASSEMBLY BUT NOT INDEPENDENTLY.				
⚠ TU201	VTUATEDE9-023	R	VHF Tuner(20BM2S/G)	BB
⚠ TU201	VTUVTST5HD84/	R	VHF Tuner (14BM2S/G/21BM2S/G)	BB
INTEGRATED CIRCUITS				
IC301	VHiTDA7056A-1	R	TDA7056A	AP
IC304	VHiLA7016//-1	R	LA7016, Audio SW	AH
IC501	VHiTDA8357/-1	R	TDA8357	AN
IC402	VHiLA7016//-1	R	LA7016, Video SW	AH
IC605	VHiKA7808AP-1	R	KA7808AP	AE
IC701	VHiSTRF6654-1	R	STRF6654 (20BM2S/G/21BM2S/G)	AX
IC701	VHiSTRF6653-1	R	STRF6653(14BM2S/G)	AS
IC751	VHiTA48M033-1	R	TA48M033	AH
IC753	VHiSE115N//-1	R	SE115N	AF
IC801	RH-iX3368CEN3	R	IX3368CE	BC
IC1002	VHiPST573J/-1	R	PST573J, Reset	AE
IC1003	VHiM24C04W/-1	R	M24C04W	AG
IC1005	VHiKA7805AP-1	R	KA7805AP	AE
TRANSISTORS				
Q201	VS2SC2735//1E	R	2SC2735	AC
Q203	VS2SD601A//-1	R	2SD601A	AC
Q205	VS2SC1815GW-1	R	2SC1815GW	AB
Q301	VS2SD601A//-1	R	2SD601A	AC
Q302	VS2SD601A//-1	R	2SD601A	AC
Q305	VS2SD601A//-1	R	2SD601A	AC
Q601	VS2SC2482//-1	R	2SC2482	AD
Q602	VS2SD1877//1E	R	2SD1877(14BM2S/G)	AL
Q602	VS2SD2586//1E	R	2SD2586 (20BM2S/G/21BM2S/G)	AM
Q603	VS2SD601A//-1	R	2SD601A	AC
Q723	VS2SD601A//-1	R	2SD601A	AC
Q752	VS2SC1815GW-1	R	2SC1815GW	AB
Q753	VS2SC1815GW-1	R	2SC1815GW	AB
Q801	VS2SB709A//-1	R	2SB709A	AA
Q802	VS2SB709A//-1	R	2SB709A	AA
Q1003	VS2SD601A//-1	R	2SD601A	AC
Q1010	VS2SD601A//-1	R	2SD601A	AC
DIODES				
D201	RH-EX0676GEZZ	R	Zener Diode	AA
D301	RH-DX0475CEZZ	R	DX0475CE	AB
D305	RH-EX0631GEZZ	R	Zener Diode	AA
D308	RH-EX0631GEZZ	R	Zener Diode	AA
D311	VHDRL3Z////-1	R	RL3Z	AE
D401	RH-EX0631GEZZ	R	Zener Diode	AA
D402	RH-EX0631GEZZ	R	Zener Diode	AA
D501	RH-EX0640GEZZ	R	Zener Diode	AA
D502	RH-DX0475CEZZ	R	DX0475CE	AB
D503	RH-DX0475CEZZ	R	DX0475CE	AB
D504	RH-DX0475CEZZ	R	DX0475CE	AB
D505	RH-DX0127CEZZ	R	DX0127CE	AC
D507	RH-DX0475CEZZ	R	DX0475CE	AB
D508	RH-EX0647GEZZ	R	Zener Diode	AA
D509	RH-EX0647GEZZ	R	Zener Diode	AA
D510	RH-EX0867CEZZ	R	Zener Diode	AC
D511	RH-EX0867CEZZ	R	Zener Diode	AC
D512	RH-DX0475CEZZ	R	DX0475CE	AB
D513	RH-DX0475CEZZ	R	DX0475CE	AB
D514	RH-EX0903CEZZ	R	Zener Diode	AC
D515	RH-EX0903CEZZ	R	Zener Diode	AC
D602	RH-DX0475CEZZ	R	DX0475CE	AB
D603	RH-DX0131CEZZ	R	DX0131CE	AC

Ref. No.	Part No.	★	Description	Code
D604	RH-DX0475CEZZ	R	DX0475CE	AB
D605	RH-EX0840CEZZ	R	Zener Diode	AC
D606	RH-DX0475CEZZ	R	DX0475CE	AB
D607	RH-EX0658GEZZ	R	Zener Diode (20BM2S/G/21BM2S/G)	AA
D607	RH-EX0662GEZZ	R	Zener Diode(14BM2S/G)	AB
D608	RH-EX0604GEZZ	R	Zener Diode	AB
D609	RH-DX0475CEZZ	R	DX0475CE	AB
D610	RH-EX0662GEZZ	R	Zener Diode	AB
D611	RH-DX0302CEZZ	R	DX0302CE	AC
D612	RH-EX0627GEZZ	R	Zener Diode	AA
D613	RH-DX0475CEZZ	R	DX0475CE	AB
D614	RH-DX0475CEZZ	R	DX0475CE	AB
D701	RH-DX0386CEZZ	R	DX0386CE	AG
D702	VHD1SS82///1A	R	1SS82	AC
D705	RH-DX0492CEZZ	R	DX0492CE	AE
D706	VHD1SS82///1A	R	1SS82	AC
D707	VHD1SS82///1A	R	1SS82	AC
D708	RH-DX0400CEZZ	R	DX0400CE	AC
D709	RH-DX0164CEZZ	R	DX0164CE	AC
D710	RH-EX0601GEZZ	R	Zener Diode	AA
D711	VHD1SS82///1A	R	1SS82	AC
D713	RH-EX0621GEZZ	R	Zener Diode	AB
D750	RH-DX0475CEZZ	R	DX0475CE	AB
D752	RH-DX0475CEZZ	R	DX0475CE	AB
D753	RH-DX0471CEZZ	R	DX0471CE	AE
D758	RH-DX0461CEZZ	R	DX0461CE	AG
D760	RH-DX0475CEZZ	R	DX0475CE	AB
D763	RH-DX0475CEZZ	R	DX0475CE	AB
D801	RH-DX0475CEZZ	R	DX0475CE	AB
D802	RH-DX0475CEZZ	R	DX0475CE	AB
D803	RH-DX0475CEZZ	R	DX0475CE	AB
D804	RH-DX0475CEZZ	R	DX0475CE	AB
D805	RH-DX0475CEZZ	R	DX0475CE	AB
D806	RH-DX0475CEZZ	R	DX0475CE	AB
D1001	RH-PX0423CEZZ	R	PhotoDiode	AD
D1004	RH-DX0475CEZZ	R	DX0475CE	AB
D1007	RH-EX0867CEZZ	R	Zener Diode	AC
D1008	RH-EX0867CEZZ	R	Zener Diode	AC
D1009	RH-EX0867CEZZ	R	Zener Diode	AC
D1010	RH-EX0867CEZZ	R	Zener Diode	AC
D1011	RH-EX0627GEZZ	R	Zener Diode	AA
⚠ IC702	RH-FX0008GEZZ	R	PC123FY8	AE
⚠ VA700	RH-VX0047CEZZ	R	Varistor	AF

PACKAGED CIRCUITS

PR701	RMPTP0001PEZZ	R	Packaged Circuit (20BM2S/G/21BM2S/G)	AN
PR702	RMPTP0028CEZZ	R	Packaged Circuit (14BM2S/G)	AG
X1001	RCRSB0281CEZZ	R	Crystal, 12MHz	AG

FILTERS

CF201	RFiLC0024CEZZ	R	Filter, FiLC0024CE	AE
CF202	RFiLC0318CEZZ	R	Filter, FiLC0318CE	AG
SF201	RFiLC0442CEZZ	R	Filter, FiLC0442CE	AL

COILS

L202	VP-DF270K0000	R	Peaking, 27µH	AB
L203	VP-DF270K0000	R	Peaking, 27µH	AB
L204	VP-XF1R2K0000	R	Peaking, 1.2µH	AB
L205	VP-DF1R0K0000	R	Peaking, 1µH	AB
L207	VP-DF1R0K0000	R	Peaking, 1µH	AB
L208	VP-XF100K0000	R	Peaking, 10µH	AB
L209	VP-XF6R8K0000	R	Peaking, 6.8µH	AB
L301	VP-DF1R0K0000	R	Peaking, 1µH	AB
L401	VP-DF1R0K0000	R	Peaking, 1µH	AB
L601	VP-CF1R0M0000	R	Peaking, 1µH	AB
L603	RCiLP0225CEZZ	R	Coil, CiLP0225CE	AF
⚠ L702	RCiLF0019PEZZ	R	Coil, CiLF0019PE	AN
L802	VP-DF100K0000	R	Peaking, 10µH	AB
L803	VP-DF100K0000	R	Peaking, 10µH	AB
L1030	VP-DF100K0000	R	Peaking, 10µH	AB
L1050	VP-DF100K0000	R	Peaking, 10µH	AB
L1051	VP-DF100K0000	R	Peaking, 10µH	AB

Ref. No.	Part No.	★	Description	Code

TRANSFORMERS

⚠ T601	RTRNZ0026PEZZ	R	Transformer (20BM2S/G/21BM2S/G)	AH
⚠ T602	RTRNF0187PEZZ	R	H-Volt Transformer (14BM2S/G)	AY
⚠ T602	RTRNF0194PEN1	R	H-Volt Transformer (20BM2S/G/21BM2S/G)	AZ
⚠ T603	RTRNZ0179CEZZ	R	Transformer(14BM2S/G)	AE
⚠ T701	RTRNZ0180PEZZ	R	Transformer(14BM2S/G(Y))	AN
⚠ T701	RTRNZ0140PEZZ	R	Transformer(14BM2G)	AQ
⚠ T701	RTRNZ0181PEZZ	R	Transformer (20BM2S/G/21BM2S/G)	AN

CAPACITORS

C200	VCEA0A1CW476M	R	47	16V	Electrolytic	AB
C203	VCKYCY1HF103Z	R	0.01	50V	Ceramic	AA
C204	VCEA0A1CW107M	R	100	16V	Electrolytic	AC
C205	VCKYCY1HF103Z	R	0.01	50V	Ceramic	AA
C206	VCEA0A1HW106M	R	10	50V	Electrolytic	AB
C207	VCKYCY1HF103Z	R	0.01	50V	Ceramic	AA
C208	VCKYCY1HF103Z	R	0.01	50V	Ceramic	AA
C209	VCKYCY1HF103Z	R	0.01	50V	Ceramic	AA
C210	VCKYCY1HF103Z	R	0.01	50V	Ceramic	AA
C211	VCKYCY1EF104Z	R	0.1	25V	Ceramic	AA
C212	VCEA0A1CW106M	R	10	16V	Electrolytic	AB
C213	VCKYCY1HF223Z	R	0.022	50V	Ceramic	AB
C215	VCEA0A1CW476M	R	47	16V	Electrolytic	AB
C216	VCKYCY1HB821K	R	820p	50V	Ceramic	AA
C217	VCKYCY1HB472K	R	4700p	50V	Ceramic	AA
C302	VCEA0A1HW225M	R	2.2	50V	Electrolytic	AB
C303	VCEA0A1CW106M	R	10	16V	Electrolytic	AB
C304	VCQYTA1HM473J	R	0.047	50V	Mylar	AA
C305	VCQYTA1HM473J	R	0.047	50V	Mylar	AA
C312	VCQYTA1HM123J	R	0.012	50V	Mylar	AA
C314	VCEA0A1EW477M	R	470	25V	Electrolytic	AD
C315	VCKYPA1HF103Z	R	0.01	50V	Ceramic	AA
C317	VCEA0A1HW224M	R	0.22	50V	Electrolytic	AB
C318	VCKYCY1HB102K	R	1000p	50V	Ceramic	AA
C331	VCEA0A1HW105M	R	1	50V	Electrolytic	AB
C332	VCEA0A1EW477M	R	470	25V	Electrolytic	AD
C333	VCKYPA2HB102K	R	1000p	500V	Ceramic	AA
C356	VCKYCY1HB682K	R	6800p	50V	Ceramic	AA
C359	VCEA9M1CW106M	R	10	16V	Electrolytic	AB
C360	VCEA9M1HW225M	R	2.2	50V	Electrolytic	AB
C364	VCEA0A1CW106M	R	10	16V	Electrolytic	AB
C371	VCEA0A1CW476M	R	47	16V	Electrolytic	AB
C373	VCEA0A1CW107M	R	100	16V	Electrolytic	AC
C374	VCEA0A1HW225M	R	2.2	50V	Electrolytic	AB
C375	VCEAEA1HW225M	R	2.2	50V	Electrolytic	AB
C379	VCEA0A1HW335M	R	3.3	50V	Electrolytic	AB
C390	VCEA0A1HW105M	R	1	50V	Electrolytic	AB
C405	VCEA0A1CW107M	R	100	16V	Electrolytic	AC
C406	VCEA0A1CW477M	R	470	16V	Electrolytic	AC
C407	VCEA0A1CW106M	R	10	16V	Electrolytic	AB
C408	VCEA0A1CW106M	R	10	16V	Electrolytic	AB
C409	VCKYCY1EF104Z	R	0.1	25V	Ceramic	AA
C410	VCKYCY1EF104Z	R	0.1	25V	Ceramic	AA
C411	VCKYCY1HB102K	R	1000p	50V	Ceramic	AA
C469	VCEA0A1HW105M	R	1	50V	Electrolytic	AB
C501	VCKYCY1HF103Z	R	0.01	50V	Ceramic	AA
C502	VCKYCY1HF103Z	R	0.01	50V	Ceramic	AA
C503	VCEA0A1EW108M	R	1000	25V	Electrolytic	AD
C504	VCKYCY1HF223Z	R	0.022	50V	Ceramic	AB
C506	VCQYTA1HM104J	R	0.1	50V	Mylar	AA
C507	VCEA0A1JW107M	R	100	63V	Electrolytic	AC
C508	VCQYTA1HM103J	R	0.01	50V	Mylar	AA
C512	VCKYCY1HB102K	R	1000p	50V	Ceramic	AA
C513	VCKYCY1HB102K	R	1000p	50V	Ceramic	AA
C514	VCKYPA1HF103Z	R	0.01	50V	Ceramic	AA
C515	VCKYPA2HB102K	R	1000p	500V	Ceramic	AA
C516	VCEA0A1JW477M	R	470	63V	Electrolytic	AE
C517	VCQYTA1HM104J	R	0.1	50V	Mylar	AA
C601	VCEAGA2EW106M	R	10	250V	Electrolytic	AC
C602	VCQYTA1HM104J	R	0.1	50V	Mylar	AA
C603	VCEA0A1HW105M	R	1	50V	Electrolytic	AB
C604	VCEA0A1HW105M	R	1	50V	Electrolytic	AB
C605	VCKYPA1HF103Z	R	0.01	50V	Ceramic	AA

Ref. No.	Part No.	★	Description	Code
C606	VCKYCY1HF103Z	R	0.01 50V Ceramic	AA
C607	VCEA0A1CW477M	R	470 16V Electrolytic	AC
C608	VCEA0A1EW476M	R	47 25V Electrolytic	AB
C609	VCEA0A1EW108M	R	1000 25V Electrolytic	AD
C610	VCFYSB2EB823J	R	0.082 250V Metallized Polypro Film	AD
C611	VCKYPA2HB102K	R	1000p 500V Ceramic	AA
C612	RC-EZ0724CEZZ	R	100 160V Electrolytic	AG
C613	VCFPPD2DB564J	R	0.56 200V Metallized Polypro Film (21BM2S/G)	AF
C613	VCFPPD2DB684J	R	0.68 200V Metallized Polypro Film (20BM2S/G)	AE
C613	VCFPVC2DB394J	R	0.39 200V Metallized Polypro Film (14BM2S/G)	AE
C614	RC-KZ0035CEZZ	R	220 2kV Ceramic (14BM2S/G)	AB
C614	RC-KZ0039CEZZ	R	680p 2kV Ceramic (20BM2S/G)	AB
C615	VCFPVC2DB224J	R	0.22 200V Metallized Polypro Film	AE
C616	VCFPPD3CA103H	R	0.01 1600V Metallized Polypro Film (20BM2S/G)	AE
C616	VCFPPD3CA622H	R	6200p 1600V Metallized Polypro Film (14BM2S/G)	AE
C616	VCFPPD3CA912H	R	9100p 1600V Metallized Polypro Film (21BM2S/G)	AE
C617	VCKYPA2HB102K	R	1000p 500V Ceramic	AA
C620	VCKYCY1EF104Z	R	0.1 25V Ceramic	AA
C623	VCQYTA1HM222J	R	2200p 50V Mylar	AA
C624	VCQYTA1HM472J	R	4700p 50V Mylar	AB
C625	VCEA0A1HW105M	R	1 50V Electrolytic	AB
C626	VCKYCY1HF223Z	R	0.022 50V Ceramic	AB
C627	VCEA0A1HW106M	R	10 50V Electrolytic	AB
C628	VCEA0A1HW224M	R	0.22 50V Electrolytic	AB
C650	VCKYCY1EF104Z	R	0.1 25V Ceramic	AA
C654	VCEA0A1CW476M	R	47 16V Electrolytic	AB
C700	VCQYTA1HM103J	R	0.01 50V Mylar	AA
⚠ C701	RC-FZ031SCEZZ	R	0.1 AC250V Plastic	AD
C702	RC-KZ0160GEZZ	R	0.01 250V Ceramic	AC
C703	RC-KZ0160GEZZ	R	0.01 250V Ceramic	AC
C704	VCKYPA2HB102K	R	1000p 500V Ceramic	AA
C705	VCKYPA2HB102K	R	1000p 500V Ceramic	AA
C707	RC-EZ0804CEZZ	R	220 400V Electrolytic (20BM2S/G/21BM2S/G)	AU
C707	RC-EZ1044CEZZ	R	220 400V Electrolytic (14BM2S/G)	AM
C708	RC-KZ0160GEZZ	R	0.01 250V Ceramic	AC
C709	RC-QZA471TAYJ	R	470 50V Mylar	AB
C711	RC-KZ0339CEZZ	R	680p 2kV Ceramic	AD
C712	VCQYTA1HM102J	R	1000p 50V Mylar	AA
C713	RC-KZ007JCEZZ	R	0.01 250V Ceramic	AC
C714	RC-KZ0338CEZZ	R	560p 2kV Ceramic	AD
C715	VCKYPA2HB102K	R	1000p 500V Ceramic	AA
C716	VCEA0A1EW107M	R	100 25V Electrolytic	AC
C717	VCQYTA1HM182J	R	1800p 50V Mylar	AA
C718	VCEAGA2AW475M	R	4.7 100V Electrolytic	AB
⚠ C721	RC-KZ0102GEZZ	R	680p 2kV Ceramic	AE
C752	VCEA0A0JW107M	R	100 6.3V Electrolytic	AB
C753	VCKYPA2HB102K	R	1000p 500V Ceramic	AA
C754	VCEA0A1CW476M	R	47 16V Electrolytic	AB
C755	VCEA0A1CW108M	R	1000 16V Electrolytic	AD
⚠ C759	VCKYPA1HB102K	R	1000p 50V Ceramic	AA
C760	RC-KZ0339CEZZ	R	680p 2kV Ceramic	AD
C761	RC-EZ0724CEZZ	R	100 160V Electrolytic (14BM2S/G)	AG
C761	VCEA4W2CN227M	R	220 160V Electrolytic (20BM2S/G/21BM2S/G)	AG
C762	VCQYTA1HM473J	R	0.047 50V Mylar	AA
C801	VCEA0A1HW105M	R	1 50V Electrolytic	AB
C802	VCEA0A1CW337M	R	330 16V Electrolytic	AC

Ref. No.	Part No.	★	Description	Code
C803	VCEA9M1CW107M	R	100 16V Electrolytic	AB
C804	VCKYCY1HB222K	R	2200p 50V Ceramic	AA
C805	VCKYCY1HB102K	R	1000p 50V Ceramic	AA
C806	VCKYCY1HB102K	R	1000p 50V Ceramic	AA
C807	VCKYCY1HB102K	R	1000p 50V Ceramic	AA
C808	VCEA0A1CW107M	R	100 16V Electrolytic	AC
C809	VCKYCY1HF223Z	R	0.022 50V Ceramic	AB
C810	VCKYCY1EF104Z	R	0.1 25V Ceramic	AA
C811	VCEA0A1CW107M	R	100 16V Electrolytic	AC
C812	VCFYFA1HA224J	R	0.22 50V Mylar	AB
C813	VCFYFA1HA224J	R	0.22 50V Mylar	AB
C814	VCKYCY1HB471K	R	470p 50V Ceramic	AA
C1001	VCEA0A0JW107M	R	100 6.3V Electrolytic	AB
C1003	VCEA0A1CW106M	R	10 16V Electrolytic	AB
C1004	VCKYCY1CF474Z	R	0.47 16V Ceramic	AB
C1005	VCKYCY1HF223Z	R	0.022 50V Ceramic	AB
C1006	VCEA0A1CW106M	R	10 16V Electrolytic	AB
C1007	VCEA0A1CW106M	R	10 16V Electrolytic	AB
C1008	VCCCCY1HH330J	R	33p 50V Ceramic	AA
C1009	VCCCCY1HH330J	R	33p 50V Ceramic	AA
C1010	VCEA0A0JW107M	R	100 6.3V Electrolytic	AB
C1011	VCKYCY1HF223Z	R	0.022 50V Ceramic	AB
C1012	VCKYCY1HF223Z	R	0.022 50V Ceramic	AB
C1013	VCEA0A0JW107M	R	100 6.3V Electrolytic	AB
C1014	VCEA0A1CW106M	R	10 16V Electrolytic	AB
C1015	VCFYFA1HA474J	R	0.47 50V Mylar	AC
C1016	VCQYTA1HM104J	R	0.1 50V Mylar	AA
C1018	VCKYCY1HB221K	R	220p 50V Ceramic	AA
C1019	VCEA9M1HW225M	R	2.2 50V Electrolytic	AB

RESISTORS

JA160	VRD-RA2BE101J	R	100	1/8W	Carbon (20BM2S/G/21BM2S/G)	AB
RJ2	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ5	VRN-MD2AL000J	R	0	0.1W	Metal Film (14BM2S/G/21BM2S/G)	AA
RJ9	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ10	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ11	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ12	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ13	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ15	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ16	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ21	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ25	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ26	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ27	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ29	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ30	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ31	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ32	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ33	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ34	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ41	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ43	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ51	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ53	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ61	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ64	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ66	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ68	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ69	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ71	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ74	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ75	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ76	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ78	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ79	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ80	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ84	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ85	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ87	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ88	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ89	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ92	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ94	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA
RJ96	VRN-MD2AL000J	R	0	0.1W	Metal Film	AA

Ref. No.	Part No.	★	Description	Code
RJ97	VRN-MD2AL000J	R	0 0.1W Metal Film	AA
RJ100	VRN-MD2AL000J	R	0 0.1W Metal Film	AA
RJ103	VRN-MD2AL000J	R	0 0.1W Metal Film	AA
RJ105	VRN-MD2AL000J	R	0 0.1W Metal Film	AA
RJ201	VRN-MD2AL000J	R	0 0.1W Metal Film (14BM2S/G/21BM2S/G)	AA
RJ202	VRN-MD2AL000J	R	0 0.1W Metal Film	AA
RJ204	VRN-MD2AL000J	R	0 0.1W Metal Film	AA
RJ205	VRN-MD2AL000J	R	0 0.1W Metal Film	AA
RJ206	VRN-MD2AL000J	R	0 0.1W Metal Film (14BM2S/G)	AA
RJ206	VRS-CY1JF000J	R	0 1/16W Metal Oxide (20BM2S/G/21BM2S/G)	AA
R201	VRN-MD2AL101J	R	100 0.1W Metal Film	AA
R202	VRN-MD2AL101J	R	100 0.1W Metal Film	AA
R203	VRD-RM2HD102J	R	1k 1/2W Carbon	AA
R204	VRD-RM2HD102J	R	1k 1/2W Carbon	AA
R205	VRD-RA2BE680J	R	68 1/8W Carbon	AA
R206	VRN-MD2AL122J	R	1.2k 0.1W Metal Film	AA
R207	VRN-MD2AL221J	R	220 0.1W Metal Film	AA
R208	VRN-MD2AL122J	R	1.2k 0.1W Metal Film	AA
R209	VRN-MD2AL392J	R	3.9k 0.1W Metal Film	AA
R217	VRD-RA2BE392J	R	3.9k 1/8W Carbon	AA
R218	VRN-MD2AL102J	R	1k 0.1W Metal Film	AA
R219	VRN-MD2AL391J	R	390 0.1W Metal Film	AA
R220	VRN-MD2AL101J	R	100 0.1W Metal Film	AA
R221	VRN-MD2AL102J	R	1k 0.1W Metal Film	AA
R222	VRN-MD2AL681J	R	680 0.1W Metal Film	AA
R226	VRN-MD2AL750J	R	75 0.1W Metal Film	AA
R227	VRD-RM2HD330J	R	33 1/2W Carbon	AA
R228	VRD-RM2HD330J	R	33 1/2W Carbon	AA
R230	VRN-MD2AL101J	R	100 0.1W Metal Film	AA
R231	VRN-MD2AL153J	R	15k 0.1W Metal Film	AA
R232	VRD-RA2BE680J	R	68 1/8W Carbon	AA
R233	VRN-MD2AL181J	R	180 0.1W Metal Film	AA
R237	VRN-MD2AL272J	R	2.7k 0.1W Metal Film	AA
R238	VRN-MD2AL821J	R	820 0.1W Metal Film	AA
R239	VRN-MD2AL221J	R	220 0.1W Metal Film	AA
R302	VRN-MD2AL473J	R	47k 0.1W Metal Film	AA
R303	VRN-MD2AL473J	R	47k 0.1W Metal Film	AA
R304	VRN-MD2AL392J	R	3.9k 0.1W Metal Film	AA
R305	VRN-MD2AL100J	R	10 0.1W Metal Film	AA
R307	VRD-RA2BE182J	R	1.8k 1/8W Carbon	AA
R308	VRD-RA2BE472J	R	4.7k 1/8W Carbon	AA
R320	VRN-MD2AL101J	R	100 0.1W Metal Film	AA
R321	VRN-MD2AL561J	R	560 0.1W Metal Film	AA
R328	VRN-MD2AL564J	R	560k 0.1W Metal Film	AA
R329	VRN-MD2AL332J	R	3.3k 0.1W Metal Film	AA
R330	VRN-MD2AL101J	R	100 0.1W Metal Film	AA
R331	VRN-MD2AL102J	R	1k 0.1W Metal Film	AA
R332	VRN-MD2AL561J	R	560 0.1W Metal Film	AA
R333	VRN-MD2AL103J	R	10k 0.1W Metal Film	AA
R334	VRN-MD2AL102J	R	1k 0.1W Metal Film	AA
R341	VRN-MD2AL332J	R	3.3k 0.1W Metal Film	AA
R342	VRN-MD2AL564J	R	560k 0.1W Metal Film	AA
R343	VRN-MD2AL104J	R	100k 0.1W Metal Film	AA
R344	VRN-MD2AL101J	R	100 0.1W Metal Film	AA
R357	VRN-MD2AL100J	R	10 0.1W Metal Film	AA
R378	VRN-VV3DBR68J	R	0.68 2W Metal Film	AA
R403	VRN-MD2AL101J	R	100 0.1W Metal Film	AA
R404	VRD-RA2BE820J	R	82 1/8W Carbon	AA
R406	VRN-MD2AL103J	R	10k 0.1W Metal Film	AA
R407	VRN-MD2AL101J	R	100 0.1W Metal Film	AA
R411	VRD-RA2BE820J	R	82 1/8W Carbon	AA
R412	VRN-MD2AL101J	R	100 0.1W Metal Film	AA
R501	VRN-MD2AL182J	R	1.8k 0.1W Metal Film	AA
R502	VRN-MD2AL182J	R	1.8k 0.1W Metal Film	AA
R503	VRD-RM2HD1R5J	R	1.5 1/2W Carbon (20BM2S/G/21BM2S/G)	AA
R503	VRD-RM2HD2R2J	R	2.2 1/2W Carbon (14BM2S/G)	AA
R504	VRD-RM2HD150J	R	15 1/2W Carbon (14BM2S/G)	AA
⚠ R505	VRG-PD2HD330J	R	33 1/2W Fuse Resistor	AC
R506	VRD-RA2BE124J	R	120k 1/8W Carbon (14BM2S/G)	AA
R506	VRD-RA2BE224J	R	220k 1/8W Carbon (20BM2S/G/21BM2S/G)	AA

Ref. No.	Part No.	★	Description	Code
R508	VRD-RM2HD221J	R	220 1/2W Carbon	AA
R509	VRD-RM2HD1R0J	R	1 1/2W Carbon	AA
R510	VRN-MD2AL101J	R	100 0.1W Metal Film	AA
R511	VRN-MD2AL101J	R	100 0.1W Metal Film	AA
R513	VRD-RA2BE393J	R	39k 1/8W Carbon	AA
R514	VRN-MD2AL101J	R	100 0.1W Metal Film	AA
R515	VRN-MD2AL272J	R	2.7k 0.1W Metal Film	AA
R516	VRD-RM2HD223J	R	22k 1/2W Carbon	AA
R602	VRN-VV3AB1R5J	R	1.5 1W Metal Film (14BM2S/G)	AA
R602	VRN-VV3DBR68J	R	0.68 2W Metal Film (20BM2S/G)	AA
R602	VRN-VV3DBR82J	R	0.82 2W Metal Film (21BM2S/G)	AB
R603	VRD-RM2HD102J	R	1k 1/2W Carbon	AA
R604	VRD-RA2BE393J	R	39k 1/8W Carbon	AA
R605	VRD-RM2HD101J	R	100 1/2W Carbon	AA
R606	VRD-RA2BE333J	R	33k 1/8W Carbon (20BM2S/G/21BM2S/G)	AA
R607	VRN-MD2AL102J	R	1k 0.1W Metal Film	AA
R608	VRN-MD2AL123J	R	12k 0.1W Metal Film	AA
R609	VRD-RA2BE153G	R	15k 1/8W Carbon (21BM2S/G)	AA
R609	VRD-RA2BE223G	R	22k 1/8W Carbon (20BM2S/G)	AA
R609	VRD-RA2BE273G	R	27k 1/8W Carbon (14BM2S/G)	AA
R610	VRD-RA2BE153J	R	15k 1/8W Carbon (14BM2S/G)	AA
R610	VRD-RA2BE822J	R	8.2k 1/8W Carbon (20BM2S/G/21BM2S/G)	AA
R611	VRD-RA2EE563G	R	56k 1/4W Carbon (20BM2S/G/21BM2S/G)	AA
R611	VRD-RA2EE823G	R	82k 1/4W Carbon (14BM2S/G)	AA
R612	VRD-RA2BE103J	R	10k 1/8W Carbon	AA
R613	VRD-RA2BE103J	R	10k 1/8W Carbon	AA
R614	VRN-MD2AL103J	R	10k 0.1W Metal Film	AA
R615	VRS-KT3LB332J	R	3.3k 3W Metal Oxide	AC
R616	VRN-MD2AL102J	R	1k 0.1W Metal Film	AA
R617	VRD-RM2HD472J	R	4.7k 1/2W Carbon	AA
R618	VRS-KA3HG3R3K	R	3.3 5W Metal Oxide (20BM2S/G/21BM2S/G)	AD
R618	VRS-KA3HG4R7K	R	4.7 5W Metal Oxide (14BM2S/G)	AD
R619	VRD-RM2HD682J	R	6.8k 1/2W Carbon	AA
R622	VRS-VV3DB331J	R	330 2W Metal Oxide (20BM2S/G/21BM2S/G)	AA
R623	VRS-VV3DB150J	R	15 2W Metal Oxide (20BM2S/G/21BM2S/G)	AA
R624	VRD-RA2BE101J	R	100 1/8W Carbon	AB
R625	VRN-MD2AL184J	R	180k 0.1W Metal Film	AA
R626	VRN-MD2AL472J	R	4.7k 0.1W Metal Film	AA
R627	VRD-RM2HD4R7J	R	4.7 1/2W Carbon (14BM2S/G)	AA
R628	VRD-RM2HD470J	R	47 1/2W Carbon	AA
R630	VRN-MD2AL100J	R	10 0.1W Metal Film	AA
R631	VRN-MD2AL391J	R	390 0.1W Metal Film	AA
R632	VRN-MD2AL273J	R	27k 0.1W Metal Film	AA
R633	VRN-MD2AL102J	R	1k 0.1W Metal Film	AA
R635	VRN-MD2AL822J	R	8.2k 0.1W Metal Film	AA
R636	VRN-MD2AL223J	R	22k 0.1W Metal Film	AA
R637	VRD-RM2HD391J	R	390 1/2W Carbon (14BM2S/G)	AA
R638	VRN-MD2AL103J	R	10k 0.1W Metal Film (20BM2S/G/21BM2S/G)	AA
R638	VRN-MD2AL333J	R	33k 0.1W Metal Film (14BM2S/G)	AA
R701	VRW-KQ3NC3R3K	R	3.3 7W Cement (14BM2S/G)	AE
R701	VRW-KQ4AC3R3K	R	3.3 10W Cement (20BM2S/G/21BM2S/G)	AE
R703	VRS-KT3LB473J	R	47k 3W Metal Oxide	AE
R705	VRD-RA2BE122J	R	1.2k 1/8W Carbon	AA
R706	VRD-RM2HD152J	R	1.5k 1/2W Carbon	AA
R707	VRS-KT3LB473J	R	47k 3W Metal Oxide	AE
R708	VRD-RM2HD272J	R	2.7k 1/2W Carbon	AA

Ref. No.	Part No.	★	Description	Code
R709	VRD-RA2BE681J	R	680 1/8W Carbon	AA
R710	VRN-VV3ABR39J	R	0.39 1W Metal Film	AA
R711	VRN-VV3ABR33J	R	0.33 1W Metal Film	AA
⚠ R712	VRG-PD2HD150J	R	15 1/2W (20BM2S/G/21BM2S/G)	AC
⚠ R712	VRG-PD2HD4R7J	R	4.7 1/2W (14BM2S/G)	AC
R717	VRD-RM2HD124J	R	120k 1/2W Carbon	AA
R718	VRD-RM2HD124J	R	120k 1/2W Carbon	AA
⚠ R719	VRC-UA2HG825K	R	8.2M 1/2W Solid	AA
R721	VRD-RA2BE393J	R	39k 1/8W Carbon	AA
R722	VRD-RM2HD124J	R	120k 1/2W Carbon	AA
R723	VRD-RA2BE684J	R	680k 1/8W Carbon	AA
⚠ R726	VRC-UA2HG825K	R	8.2M 1/2W Solid	AA
R728	VRN-MD2AL272J	R	2.7k 0.1W Metal Film	AA
R750	VRD-RM2HD4R7J	R	4.7 1/2W Carbon	AA
R755	VRD-RA2BE222J	R	2.2k 1/8W Carbon	AA
R756	VRN-MD2AL152J	R	1.5k 0.1W Metal Film	AA
R758	VRD-RA2BE102J	R	1k 1/8W Carbon	AA
R759	VRN-MD2AL102J	R	1k 0.1W Metal Film	AA
R760	VRD-RA2BE471J	R	470 1/8W Carbon	AA
R761	VRD-RA2BE221J	R	220 1/8W Carbon	AA
R764	VRN-MD2AL272J	R	2.7k 0.1W Metal Film	AA
R766	VRD-RM2HD680J	R	68 1/2W Carbon	AA
R801	VRN-MD2AL101J	R	100 0.1W Metal Film	AA
R802	VRN-MD2AL101J	R	100 0.1W Metal Film	AA
R803	VRN-MD2AL101J	R	100 0.1W Metal Film	AA
R804	VRN-MD2AL101J	R	100 0.1W Metal Film	AA
R805	VRN-MD2AL822J	R	8.2k 0.1W Metal Film	AA
R806	VRD-RA2BE123J	R	12k 1/8W Carbon	AA
R807	VRN-MD2AL103J	R	10k 0.1W Metal Film	AA
R808	VRN-MD2AL221J	R	220 0.1W Metal Film	AA
R809	VRD-RA2BE224J	R	220k 1/8W Carbon	AA
R811	VRN-MD2AL563J	R	56k 0.1W Metal Film (20BM2S/G/21BM2S/G)	AA
R812	VRN-MD2AL101J	R	100 0.1W Metal Film	AA
R813	VRN-MD2AL221J	R	220 0.1W Metal Film	AA
R1001	VRD-RA2BE221J	R	220 1/8W Carbon	AA
R1002	VRN-MD2AL331J	R	330 0.1W Metal Film	AA
R1003	VRN-MD2AL471J	R	470 0.1W Metal Film	AA
R1004	VRN-MD2AL821J	R	820 0.1W Metal Film	AA
R1005	VRD-RA2BE181J	R	180 1/8W Carbon	AA
R1011	VRN-MD2AL820J	R	82 0.1W Metal Film	AA
R1012	VRN-MD2AL391J	R	390 0.1W Metal Film	AA
R1013	VRN-MD2AL101J	R	100 0.1W Metal Film	AA
R1014	VRD-RA2BE101J	R	100 1/8W Carbon	AB
R1015	VRN-MD2AL332J	R	3.3k 0.1W Metal Film	AA
R1016	VRD-RA2BE101J	R	100 1/8W Carbon	AB
R1017	VRN-MD2AL332J	R	3.3k 0.1W Metal Film	AA
R1019	VRN-MD2AL472J	R	4.7k 0.1W Metal Film	AA
R1020	VRD-RA2BE101J	R	100 1/8W Carbon	AB
R1021	VRN-MD2AL153J	R	15k 0.1W Metal Film	AA
R1022	VRD-RA2BE101J	R	100 1/8W Carbon	AB
R1023	VRN-MD2AL101J	R	100 0.1W Metal Film	AA
R1024	VRN-MD2AL122J	R	1.2k 0.1W Metal Film	AA
R1025	VRN-MD2AL101J	R	100 0.1W Metal Film	AA
R1026	VRN-MD2AL224J	R	220k 0.1W Metal Film	AA
R1027	VRD-RA2BE101J	R	100 1/8W Carbon	AB
R1028	VRD-RA2BE101J	R	100 1/8W Carbon	AB
R1030	VRN-MD2AL102J	R	1k 0.1W Metal Film	AA
R1031	VRD-RA2BE562J	R	5.6k 1/8W Carbon	AA
R1032	VRN-MD2AL332J	R	3.3k 0.1W Metal Film	AA
R1033	VRD-RA2BE102J	R	1k 1/8W Carbon	AA
R1034	VRD-RA2BE101J	R	100 1/8W Carbon	AB
R1035	VRN-MD2AL332J	R	3.3k 0.1W Metal Film	AA
R1036	VRN-MD2AL332J	R	3.3k 0.1W Metal Film	AA
R1037	VRD-RA2BE101J	R	100 1/8W Carbon	AB
R1038	VRD-RA2BE101J	R	100 1/8W Carbon	AB
R1039	VRN-MD2AL223J	R	22k 0.1W Metal Film	AA
R1040	VRN-MD2AL101J	R	100 0.1W Metal Film	AA
R1041	VRN-MD2AL101J	R	100 0.1W Metal Film	AA
R1043	VRN-MD2AL153J	R	15k 0.1W Metal Film	AA
R1044	VRN-MD2AL153J	R	15k 0.1W Metal Film	AA
R1045	VRD-RA2BE271J	R	270 1/8W Carbon	AA
R1046	VRD-RA2BE101J	R	100 1/8W Carbon	AB
R1065	VRN-MD2AL101J	R	100 0.1W Metal Film	AA
R1067	VRN-MD2AL000J	R	0 0.1W Metal Film	AA

Ref. No.	Part No.	★	Description	Code
BALUNES				
FB306	RBLN-0037CEZZ	R	Balun, BLN-0037CE	AB
FB501	RBLN-0037CEZZ	R	Balun, BLN-0037CE	AB
FB502	RBLN-0037CEZZ	R	Balun, BLN-0037CE	AB
FB602	RBLN-0037CEZZ	R	Balun, BLN-0037CE	AB
FB701	RBLN-0037CEZZ	R	Balun, BLN-0037CE	AB
FB702	RBLN-0037CEZZ	R	Balun, BLN-0037CE	AB
FB751	RBLN-0037CEZZ	R	Balun, BLN-0037CE	AB
FB752	RBLN-0037CEZZ	R	Balun, BLN-0037CE	AB
SWITCHES				
⚠ S701	QSW-P0591CEZZ	R	Switch	AQ
S1001	QSW-K0077GEZZ	R	Switch, CH Up	AB
S1002	QSW-K0077GEZZ	R	Switch, CH Down	AB
S1003	QSW-K0077GEZZ	R	Switch, VOL Up	AB
S1004	QSW-K0077GEZZ	R	Switch, VOL Down	AB
S1005	QSW-K0077GEZZ	R	Switch, Picture/Preset	AB
MISCELLANEOUS PARTS				
RDA754	PRDAR0224PEFW	R	Heat Sink, Q602	AF
RDA756	PRDAR0248PEFW	R	Heat Sink, IC301	AF
RDA701	PRDAR0260PEFW	R	Heat Sink, IC701	AH
RDA501	PRDAR0298PEFW	R	Heat Sink, IC501 (20BM2S/G/21BM2S/G)	AF
RDA501	PRDAR0283PEFW	R	Heat Sink, IC501 (14BM2S/G)	AF
⚠ FH701	QFSHD1014CEZZ	R	Fuse Holder	AC
⚠ FH702	QFSHD1013CEZZ	R	Fuse Holder	AC
⚠ F701	QFS-C3229CEZZ	R	Fuse, T3.15A 250V	AD
J402	QJAKE0205CE04	R	Jack, 3Pin	AD
J403	QJAKE0205CE09	R	Jack, 3Pin	AD
J405	QJAKH0011AJZZ	R	Jack, 18Pin	AK
P301	QPLGN0441CEZZ	R	Plug, 4Pin	AB
P502	QPLGN0660CEZZ	R	Plug, 6Pin	AC
P602	QPLGN0641CEZZ	R	Plug, 6Pin	AB
P701	QPLGN0260CEZZ	R	Plug, 2Pin	AC
P712	QPLGN0269GEZZ	R	Plug, 2Pin	AB
P1001	QPLGN0541CEZZ	R	Plug, 5Pin	AB
P1002	QPLGN0541CEZZ	R	Plug, 5Pin	AB
RMC1001	RRMCU0235CEZZ	R	Remote Receiver	AK
TP201	QLUGP0102PEZZ	R	Lug	AA
	LHLDP1066PE00	R	Holder	AC

DUNTK9990WEV0(14BM2S/G(Y))
DUNTK9990WEV3(14BM2G)
DUNTK9990WEV6(20BM2S)
DUNTK9990WEV7(20BM2G)
DUNTK9990WEV9(21BM2S/G)
CRT UNIT

TRANSISTORS				
Q870	VSBF422////-1	R	BF422	AC
Q871	VSBF422////-1	R	BF422	AC
Q872	VSBF422////-1	R	BF422	AC
Q883	VSBF421////-1	R	BF421	AC
Q885	VSBF421////-1	R	BF421	AC
Q887	VSBF421////-1	R	BF421	AC
DIODES				
D811	RH-DX0475CEZZ	R	DX0475CE	AB
D812	RH-DX0475CEZZ	R	DX0475CE	AB
D880	RH-DX0475CEZZ	R	DX0475CE	AB
D881	RH-DX0475CEZZ	R	DX0475CE	AB
D882	RH-DX0475CEZZ	R	DX0475CE	AB
D883	VHD1SS82///1A	R	1SS82	AC
D884	VHD1SS82///1A	R	1SS82	AC
D885	VHD1SS82///1A	R	1SS82	AC
D886	VHD1SS82///1A	R	1SS82	AC
D887	VHD1SS82///1A	R	1SS82	AC
D888	VHD1SS82///1A	R	1SS82	AC
D890	RH-EX0627GEZZ	R	Zener Diode (20BM2S/G/21BM2S/G)	AA

Ref. No.	Part No.	★	Description	Code
			CAPACITORS	
C871	VCKYPA1HB471K	R	470p 50V Ceramic	AA
C872	VCKYPA1HB471K	R	470p 50V Ceramic	AA
C873	VCKYPA1HB471K	R	470p 50V Ceramic	AA
C875	VCKYPA2HB102K	R	1000p 500V Ceramic	AA
C876	RC-KZ0150CEZZ	R	Capacitor	AB
C878	VCEAGA2EW106M	R	10 250V Electrolytic (14BM2S/G)	AC
C878	VCEAGA2EW336M	R	33 250V Electrolytic (20BM2S/G/21BM2S/G)	AD
C880	VCKYPA1HB471K	R	470p 50V Ceramic	AA
C881	VCKYPA1HB471K	R	470p 50V Ceramic	AA
C882	VCKYPA1HB471K	R	470p 50V Ceramic	AA
			RESISTORS	
R879	VRD-RA2BE471J	R	470 1/8W Carbon	AA
R880	VRD-RA2BE471J	R	470 1/8W Carbon	AA
R881	VRD-RA2BE471J	R	470 1/8W Carbon	AA
R882	VRS-VU3DE153J	R	15k 2W Metal Oxide	AB
R883	VRD-RM2HD272J	R	2.7k 1/2W Carbon	AA
R884	VRS-VU3DE153J	R	15k 2W Metal Oxide	AB
R885	VRD-RM2HD272J	R	2.7k 1/2W Carbon	AA
R886	VRS-VU3DE153J	R	15k 2W Metal Oxide	AB
R887	VRD-RM2HD272J	R	2.7k 1/2W Carbon	AA
R888	VRD-RA2BE471J	R	470 1/8W Carbon (14BM2S/G)	AA
R892	VRD-RA2BE102J	R	1k 1/8W Carbon	AA
R893	VRD-RA2BE102J	R	1k 1/8W Carbon	AA
R894	VRD-RA2BE102J	R	1k 1/8W Carbon	AA
R895	VRD-RA2BE471J	R	470 1/8W Carbon (20BM2S/G/21BM2S/G)	AA
R896	VRD-RA2BE471J	R	470 1/8W Carbon (20BM2S/G/21BM2S/G)	AA
R898	VRD-RA2BE471J	R	470 1/8W Carbon (14BM2S/G)	AA
R899	VRD-RA2BE471J	R	470 1/8W Carbon	AA
			MISCELLANEOUS PARTS	
P851	QPLGN0641CEZZ	R	Plug (20BM2S/G/21BM2S/G)	AB
P851	QPLGN0661CEZZ	R	Plug, 6Pin(14BM2S/G)	AD
P882	QPLGN0541CEZZ	R	Plug (20BM2S/G/21BM2S/G)	AB
P882	QPLGN0561CEZZ	R	Plug, 5Pin(14BM2S/G)	AB
⚠ SC882	QSOCV0931CEZZ	R	Socket	AK

MISCELLANEOUS PARTS

	QANTR0018PEZZ	R	Rod Antenna(14BM2S/G)	AQ
	QACCZ2008PEZZ	R	AC Cord	AM
	QCNW-2377PEZZ	R	Connecting Cord (14BM2S/G)	AE
	QCNW-2380PEZZ	R	Connecting Cord (14BM2S/G)	AG
	QCNW-2381PEZZ	R	Connecting Cord (20BM2S/G/21BM2S/G)	AG
	QCNW-2405PEZZ	R	Connecting Cord (20BM2S/G/21BM2S/G)	AE
	QCNW-2423PEN1	R	Connecting Cord (14BM2S/G)	AF
	QCNW-2433PEN1	R	Connecting Cord (20BM2S/G/21BM2S/G)	AF
	VSP1206PB50WA	R	Speaker (20BM2S/G/21BM2S/G)	AP
	VSP9050PB25WA	R	Speaker(14BM2S/G)	AM

Ref. No.	Part No.	★	Description	Code

SUPPLIED ACCESSORIES

ACCESSORIES

	RRMCG1342PESA	R	Infrared R-C	AU
	TiNS-7170PEZZ	R	Instruction Book	AK
	QPLGJ0113CEZZ	R	Plug(14BM2S/G)	AG

ACCESSORY *(NOT REPLACEMENT ITEM)*

	TCAUA0002PEZZ	-	Caution Card	—

PACKING PARTS *(NOT REPLACEMENT ITEM)*

	SPAKC6436PEZZ	-	Packing Case(21BM2S)	—
	SPAKC6437PEZZ	-	Packing Case(21BM2G)	—
	SPAKC6687PEZZ	-	Packing Case(14BM2S)	—
	SPAKC6688PEZZ	-	Packing Case(14BM2G/G(Y))	—
	SPAKC6691PEZZ	-	Packing Case(20BM2S)	—
	SPAKC6695PEZZ	-	Packing Case(20BM2G)	—
	SPAKX2755PEZZ	-	Packing Add.(14BM2S/G)	—
	SPAKX2756PEZZ	-	Packing Add. (20BM2S/G/21BM2S/G)	—
	SSAKA0031PEZZ	-	Polyethylene Bag	—
	SSAKH0015PEZZ	-	Polyethylene Bag (14BM2S/G)	—
	SSAKH0016PEZZ	-	Polyethylene Bag (20BM2S/G/21BM2S/G)	—

CABINET PARTS

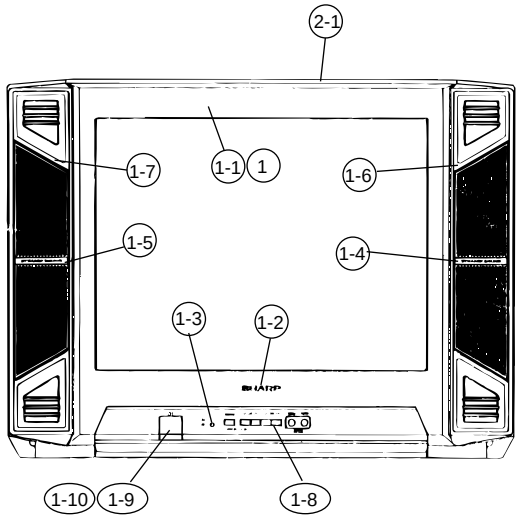
14BM2S/G

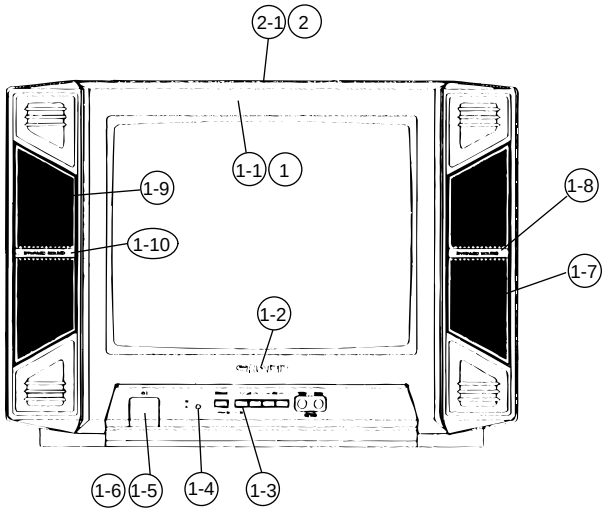
1	CCABA2621WEV0	R	Front Cabinet Ass'y (14BM2S)	BE
1	CCABA2621WEV1	R	Front Cabinet Ass'y (14BM2G/G(Y))	BE
1-1	*Not Available*	-	Front Cabinet	—
1-2	HBDGB0019PESB	R	SHARP Badge	AD
1-3	JBTN-0345PESA	R	Control Button(14BM2S)	AG
1-3	JBTN-0345PESB	R	Control Button(14BM2G)	AH
1-4	HDECQ0186PESA	R	LED, R/C Cover	AD
1-5	JBTN-0346PESA	R	Power Button(14BM2S)	AD
1-5	JBTN-0346PESB	R	Power Button(14BM2G)	AD
1-6	MSPRC0068CEFW	R	Power Button Spring	AA
1-7	HDECQ0184PESA	R	Right Speaker Net	AK
1-8	HDECA0081PESA	R	Right Speaker Decoration	AE
1-9	HDECQ0185PESA	R	Left Speaker Kit	AK
1-10	HDECA0082PESA	R	Left Speaker Decoration	AE
2	CCABB2432WEV0	R	Rear Cabinet Ass'y	AX
2-1	*Not Available*	-	Rear Cabinet	—

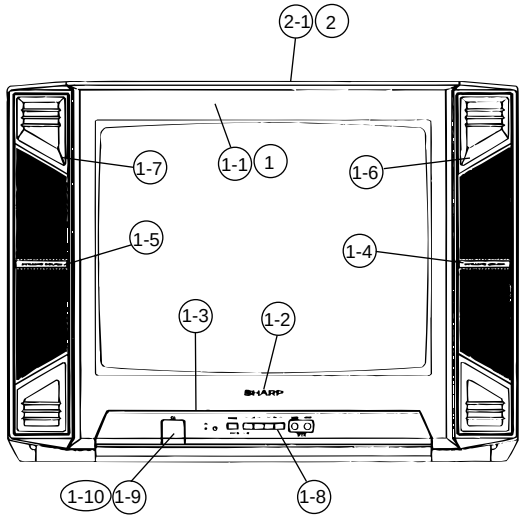
20BM2S/G

1	CCABA2628WEV0	R	Front Cabinet Ass'y (20BM2S)	BM
1	CCABA2628WEV1	R	Front Cabinet Ass'y (20BM2G)	BM
1-1	*Not Available*	-	Front Cabinet	—
1-2	HBDGB0015PESB	R	SHARP Badge	AE
1-3	HDECQ0186PESA	R	RC/LED Cover	AD
1-4	HDECA0083PESA	R	SP Decoration-R	AE
1-5	HDECA0084PESA	R	SP Decoration-L	AE
1-6	HDECQ0187PESA	R	SP NET-R(20BM2S)	AQ
1-6	HDECQ0187PESB	R	SP NET-R(20BM2G)	AQ
1-7	HDECQ0188PESA	R	SP NET-L(20BM2S)	AQ
1-7	HDECQ0188PESB	R	SP NET-L(20BM2G)	AQ
1-8	JBTN-0345PESA	R	Control Button(20BM2S)	AG
1-8	JBTN-0345PESB	R	Control Button(20BM2G)	AH
1-9	JBTN-0347PESA	R	Power Button(20BM2S)	AD
1-9	JBTN-0347PESB	R	Power Button(20BM2G)	AD

Ref. No.	Part No.	★	Description	Code
2	CCABB2434WEV0	R	Rear Cabinet Ass'y	BA
2-1	*Not Available*	-	Rear Cabinet	—
	21BM2S/G			
1	CCABA2648WEV0	R	Front Cabinet Ass'y (21BM2S)	BL
1	CCABA2648WEV1	R	Front Cabinet Ass'y (21BM2G)	BL
1-1	*Not Available*	-	Front Cabinet	—
1-2	HBDGB0015PESB	R	SHARP Badge	AE
1-3	HDECQ0186PESA	R	RC/LED Cover	AD
1-4	HDECA0083PESA	R	SP Decoration-R	AE
1-5	HDECA0084PESA	R	SP Decoration-L	AE
1-6	HDECQ0187PESA	R	SP NET-R	AQ
1-6	HDECQ0187PESB	R	SP NET-R	AQ
1-7	HDECQ0188PESA	R	SP NET-L	AQ
1-7	HDECQ0188PESB	R	SP NET-L	AQ
1-8	JBTN-0345PESA	R	Control Button(21BM2S)	AG
1-8	JBTN-0345PESB	R	Control Button(21BM2G)	AH
1-9	JBTN-0347PESA	R	Power Button	AD
1-9	JBTN-0347PESB	R	Power Button	AD
2-1	CCABB2434WEV0	R	Rear Cabinet Ass'y	BA







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